

No. 859,589.

PATENTED JULY 9, 1907.

G. W. WOOD.
ORE SEPARATOR.

APPLICATION FILED OCT. 23, 1906.

3 SHEETS—SHEET 1.

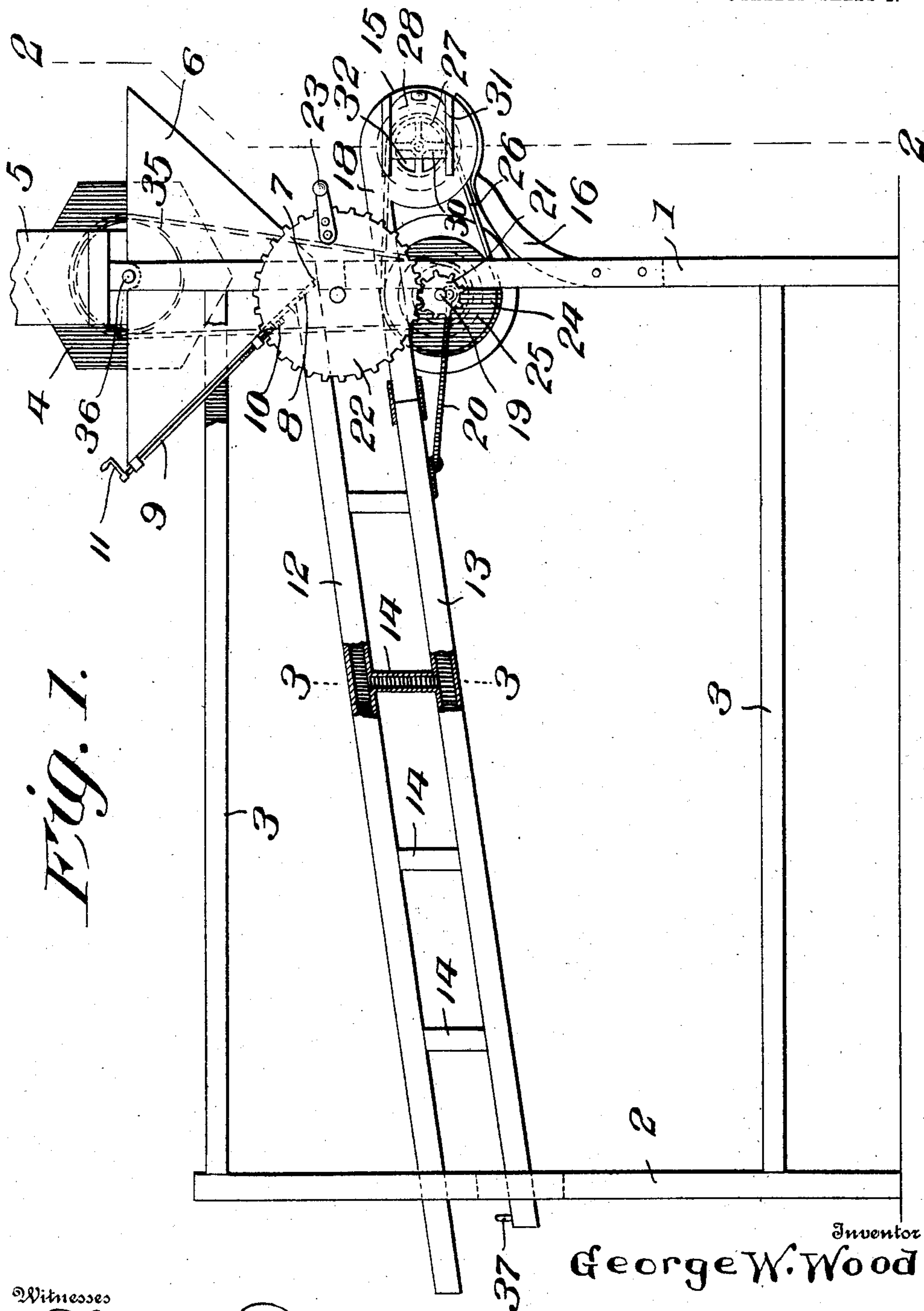


Fig. 1.

Witnesses

Thomas W. Riley
L. O. Anderson

By

W. J. Fitzgerald & Co.
Attorneys

Inventor

George W. Wood

No. 859,589.

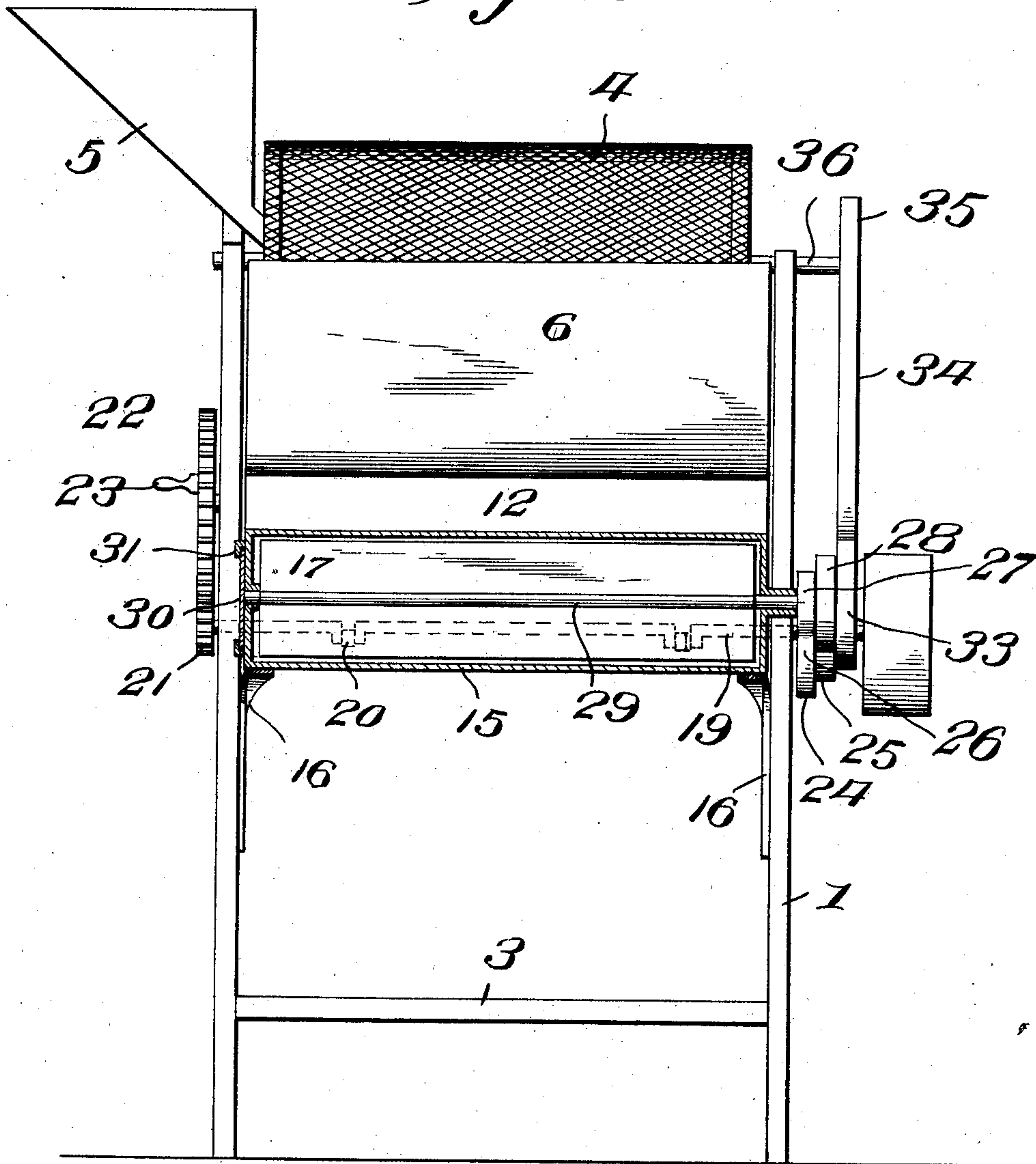
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3 SHEETS—SHEET 2.

Fig. 2



George W. Wood^{Inventor}

Witnesses

Thorw. C. By
L. O. Anderson

By

W. J. Fitzgerald & Co
Attorneys

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ORE SEPARATOR.
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3 SHEETS—SHEET 3.

Fig. 4.

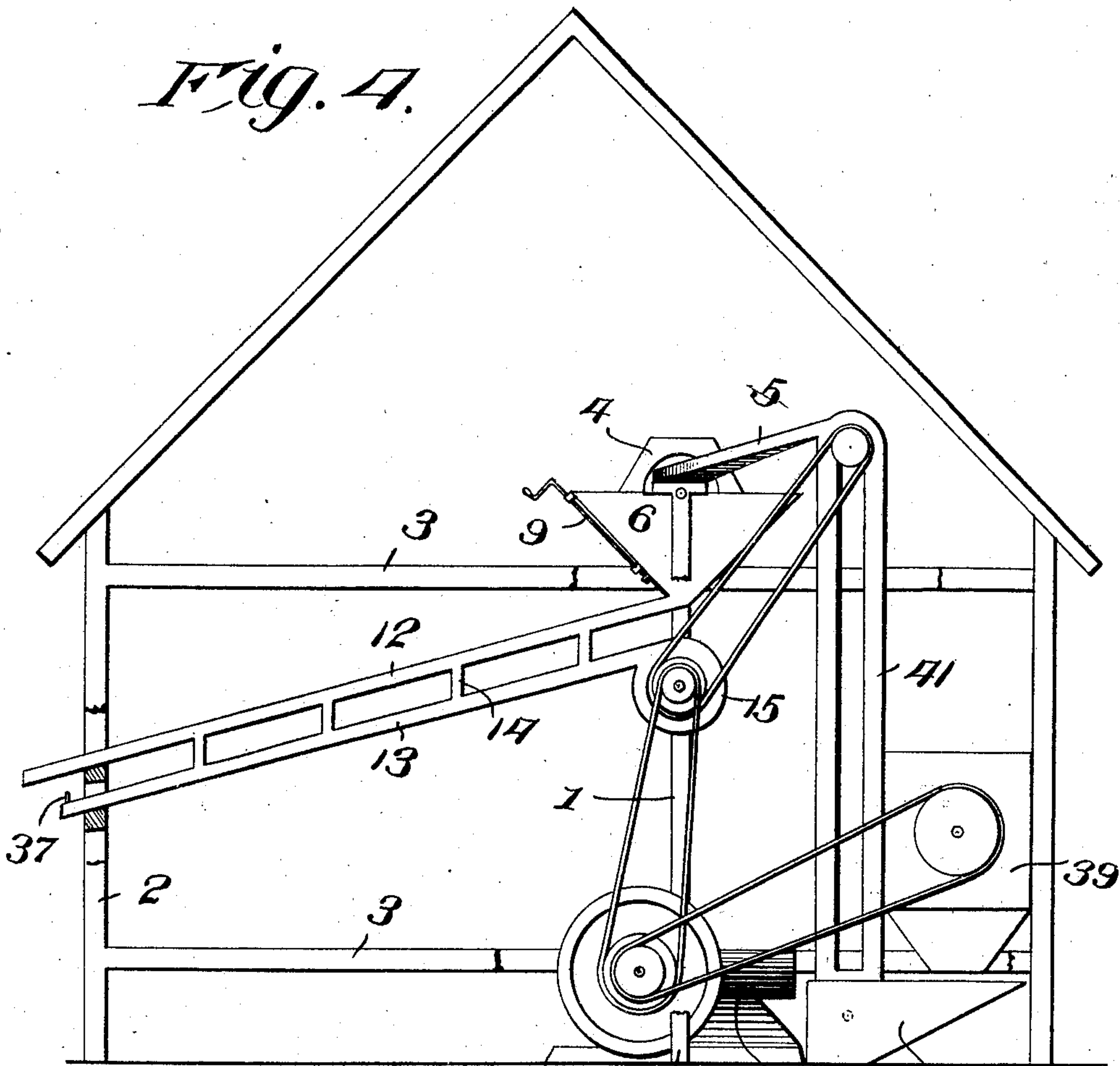
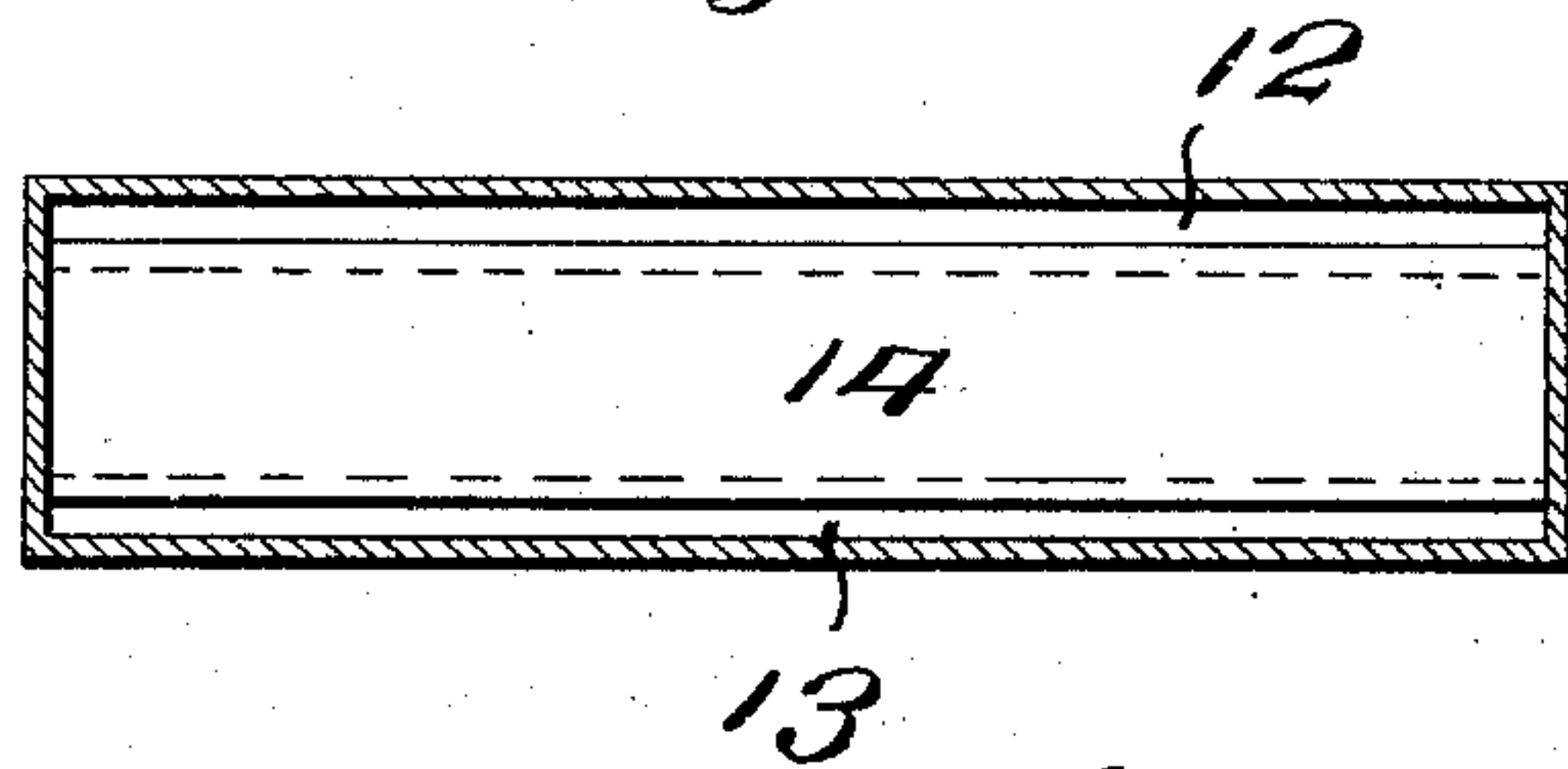


Fig. 3.



George W. Wood ^{Inventor}

Witnesses

Thos. W. Ray
L. H. Anderson

By *W. J. Fitzgerald & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE W. WOOD, OF WEATHERBY, MISSOURI.

ORE-SEPARATOR.

No. 859,589.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed October 23, 1906. Serial No. 340,236.

To all whom it may concern:

Be it known that I, GEORGE W. WOOD, a citizen of the United States, residing at Weatherby, in the county of Daviess and State of Missouri, have invented certain new and useful Improvements in Ore-Separators; and I do hereby 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.

My invention relates to ore separators, and more particularly to that class adapted to be used for separating the ore after the same has been properly crushed, and my object is to provide means for screening the crushed ore and depositing the same into a suitable separator.

A further object is to provide means for removing the dust and other particles from the ore after the same has been screened.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the claims.

In the accompanying drawings which are made a part of this application, Figure 1 is a side elevation partly in section of my improved separator. Fig. 2 is a sectional view as seen from line 2—2, Fig. 1. Fig. 3 is a sectional view as seen from line 3—3, Fig. 1, and Fig. 4 is a diagrammatic view of a building showing a slightly modified form of separator therein, and also the machinery for crushing the ore and operating the separator.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 and 2 indicate standards which are held in a vertical position by means of rails 3, said rails being disposed between the standards 1 and 2 and secured thereto in any preferred manner.

Rotatably mounted at the upper ends of the standards 1 is a screen 4, which may be of any preferred form and preferably hexagonal, into which is adapted to be deposited crushed ore, the ore being introduced into one end of the screen 4 through a spout 5, the screen being mounted in a horizontal position upon the standards 1.

Mounted immediately below the screen 4 and extending the full length thereof is a hopper 6, into which is deposited the ore particles passing through the meshes of the screen 4, the lower end of the hopper being provided with a suitable outlet 7, the extent of which is controlled through the medium of a slide 8. This slide is controlled by means of a rod 9 rotatably mounted upon one face of the hopper 6 and threaded at its lower end to engage a threaded ear 10 on the slide 8, while the upper end of the rod is provided with a crank 11 for convenience of rotating the rod 9, and it will be seen that by rotating the rod 9 in one direction the slide 8 will be lowered and the size of the out-

let 7 decreased, while if the rod 9 is rotated in the opposite direction the slide will be elevated and the size of the outlet increased.

The hopper 6 is secured to one end of a chute 12, the free end of the chute being slidably mounted in any preferred manner between the standards 2. An auxiliary chute 13 is disposed below the chute 12 and parallel therewith, said chutes being connected at intervals by vertically disposed sections 14, so that the contents of the chute 12 in passing through the chute will descend through the pipe sections 14 and enter the auxiliary chute 13.

A fan casing 15 is mounted upon the standards 1 in any preferred manner, as by brackets 16, said casing having a fan 17 mounted therein, while the mouth 18 of the fan casing 15 is telescopically secured to the inner end of the auxiliary chute 13 when the separator is in operation.

A crank shaft 19 is rotatably mounted upon the standards 1 and below the auxiliary chute 13, to the cranked portions of which are secured pitmen 20, the free end of said pitmen being secured to the lower face of the auxiliary chute 13, so that when the crank shaft 19 is rotated the chutes 12 and 13 will be oscillated, thereby causing a freer flow of the ore through said chutes.

One end of the crank shaft 19 is provided with a gear 21 which is adapted to mesh with and be driven by a driving gear 22, said gear being provided with any suitable form of crank 23. The opposite end of the crank shaft 19 is provided with pulleys 24 and 25, around which is adapted to take a driving belt 26, the opposite end of said belt being adapted to engage pulleys 27 and 28 mounted upon the fan supporting shaft 29. The pulley 25 is of less diameter than the pulley 24, while the pulley 28 is of a greater diameter than the pulley 27, and it will be readily seen that by removing the belt from the pulleys 24 and 27 and disposing the same around the pulleys 25 and 28 the speed of the fan 17 will be changed.

The volume of air directed through the auxiliary chute 13 by the fan 17 is controlled by means of a slide 30 which is mounted in suitable guides 31 secured to one end wall of the fan casing 15, the slide 30 being disposed over an opening 32 in the end of the fan casing 17. The crank shaft 19 is also provided with a pulley 33, around which is directed a belt 34, said belt being in turn disposed around a pulley 35 secured to the end of the screen supporting shaft 36, and by which means said screen is rotated.

In operation, particles of crushed ore are disposed into the screen 4 through the medium of the spout 5 and by rotating the screen through the medium of applying power to the driving gear 22, the finer particles of the ore will sift through the meshes of the screen 4 and be deposited into the hopper 6, from whence it

passes through the outlet 7 into the chute 12, and as said chute is inclined from its outer end towards the chute, the ore particles will pass longitudinally through the chute and through the pipe sections 14 into the auxiliary chute 13, and as a blast of air is continuously passing into the auxiliary chute 13 and through the pipe sections 14, it will be seen that the dust and lighter particles of foreign substances will be removed from the descending ore and blown out at the open end of the chute 12, while the ore will be blown to the outer end of the auxiliary chute 13, where it is collected by closing the end of the auxiliary chute 13 in any preferred manner, as by a slide 37, the auxiliary chute 13 being disposed at some distance beyond the last section 14 so that a considerable quantity of ore may be deposited in the auxiliary chute before it is necessary to remove the same. It will further be seen that by giving the chutes 12 and 13 a slight oscillating movement that the ore will be more readily fed through the chutes and pipe sections, although the chutes 12 and 13 may be inclined sufficiently to readily move the ore therethrough without the use of the oscillating mechanism, as shown in Fig. 4 of the drawings. In this figure the housing surrounding the fan is mounted between the standards 1 and is rigidly connected to the auxiliary chute 13, and the chutes 12 and 13 are disposed at such an angle that the ore will be conveyed therethrough without employing the oscillating movement. I have also shown in Fig. 4 the employment of an engine 38 as a driving mechanism for my improved separator, and in this connection I have also shown in outline, any suitable form of crusher 39, in which the ore is prepared or disintegrated and deposited into a receptacle 40, from whence it is conveyed and deposited in the spout 5 through the medium of an elevator 41, the crusher and elevator in this instance being shown as operated from the same source of power as is employed in operating the separating mechanism.

Should any of the particles of ore be larger than the meshes of the screen 4, said particles will be retained within the screen until such time as the machinery is stopped, when said particles are removed from the screen and again passed through the crusher 39, so that said particles will be further disintegrated and again conveyed into the screen.

What I claim is:

1. In an ore separator, the combination with a screen and means to convey crushed ore into said screen, of an os-

50 cillating hopper below said screen, an outlet at the lower end of said hopper, means to increase or decrease the size of said outlet, a chute fixed to said hopper adapted to receive the ore from said outlet, an auxiliary chute below said first mentioned chute and spaced a distance therefrom, means to convey the ore from said first mentioned chute to said auxiliary chute said chutes and ore conveying means having unobstructed passages therethrough and additional means to direct air through said auxiliary chute and into said first mentioned chute, whereby the dust and foreign particles will be removed from the ore.

2. In an ore separator of the class described, the combination with a screen and means to convey ore into said screen, of a hopper disposed below said screen, said hopper having an outlet at its lower end, a chute secured to said hopper and adapted to receive the ore from said outlet, an auxiliary chute below and parallel with said first mentioned chute each of said chutes having an unobstructed passage from end to end thereof, a plurality of pipe sections connecting said chutes, a fan telescopically secured to one end of said auxiliary chute and means to operate said fan, whereby a continuous blast of air will be directed through the ore in said chutes and pipe sections.

3. In an ore separator of the class described, the combination with a screen and means to convey ore particles into said screen, of a hopper having an outlet, an inclined chute adapted to cooperate with the outlet in said hopper, means to control the flow of the ore through said outlet, an auxiliary chute below said first mentioned chute and spaced a distance therefrom, a plurality of pipe sections connecting said chutes each of said chutes and pipe sections having an unobstructed passage there through, a blast fan, a casing surrounding said blast fan and cooperating with the upper end of said auxiliary chute and means to rotate said fan, whereby a blast of air will be directed through said chutes and pipe sections.

4. The herein described ore separator, comprising a hopper, a chute cooperating with said hopper, an auxiliary chute below said first mentioned chute, vertically disposed pipe sections connecting said chutes said chutes and pipe sections having unobstructed passages there through and means to direct air through said chutes and pipe sections.

5. An ore separator, comprising a hopper having an outlet, an inclined chute integral with said hopper and cooperating with said outlet, an inclined auxiliary chute below said first mentioned chute and parallel therewith, means to close the lower end of said auxiliary chute, a plurality of pipe sections connecting said chutes said chutes and pipe sections having unobstructed passages therethrough and means to direct a blast of air through said chutes and pipe sections.

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

GEORGE W. WOOD.

Witnesses:

EVA WISE,
H. L. JOHNSON.