

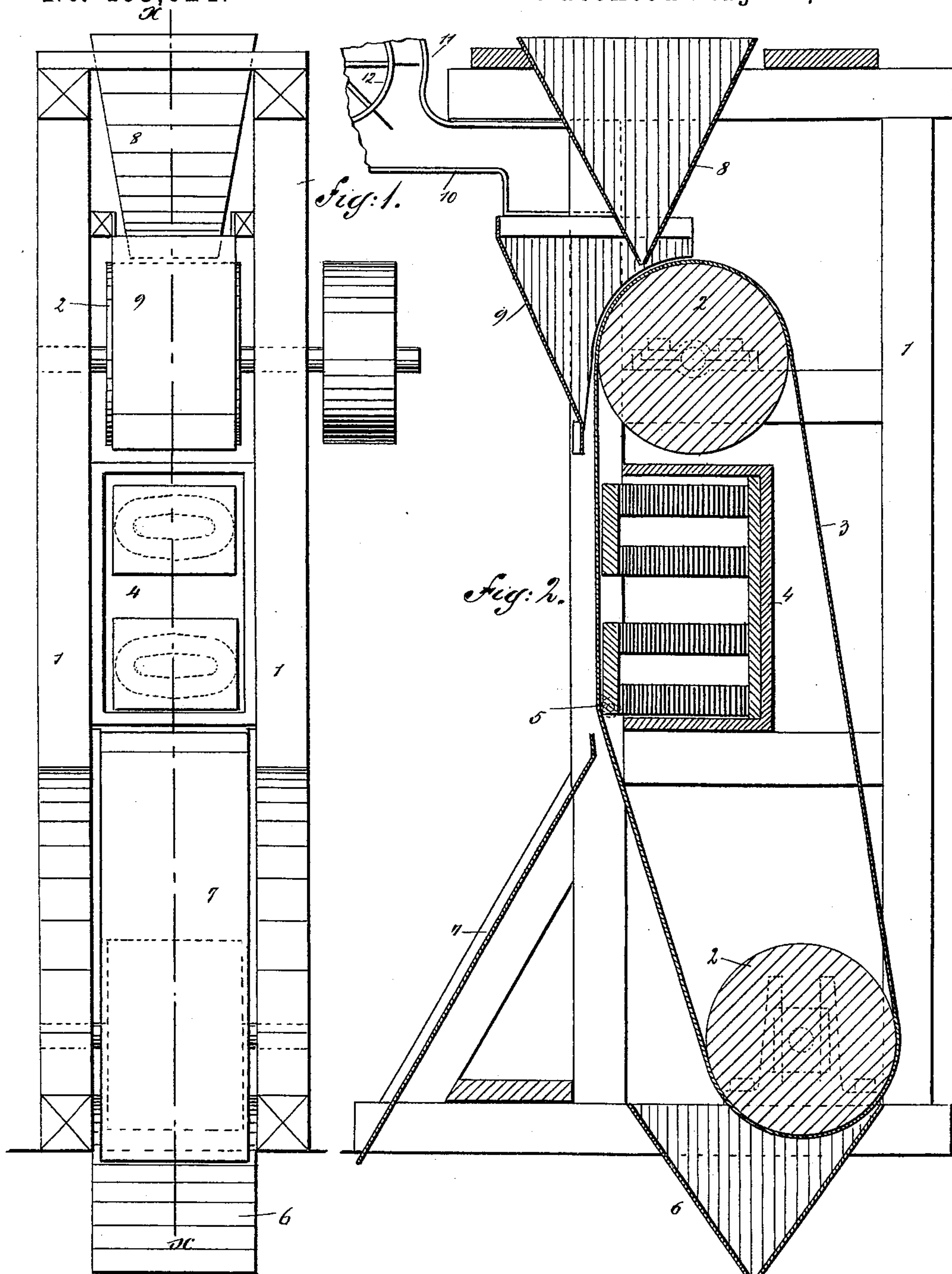
(No Model.)

2 Sheets—Sheet 1.

W. R. THOMAS.  
MAGNETIC ORE SEPARATOR.

No. 403,624.

Patented May 21, 1889.



WITNESSES:

*Chas. Viola.*  
*C. Sedgwick*

INVENTOR:

*W. R. Thomas*  
BY *Munn & Co*

ATTORNEYS.

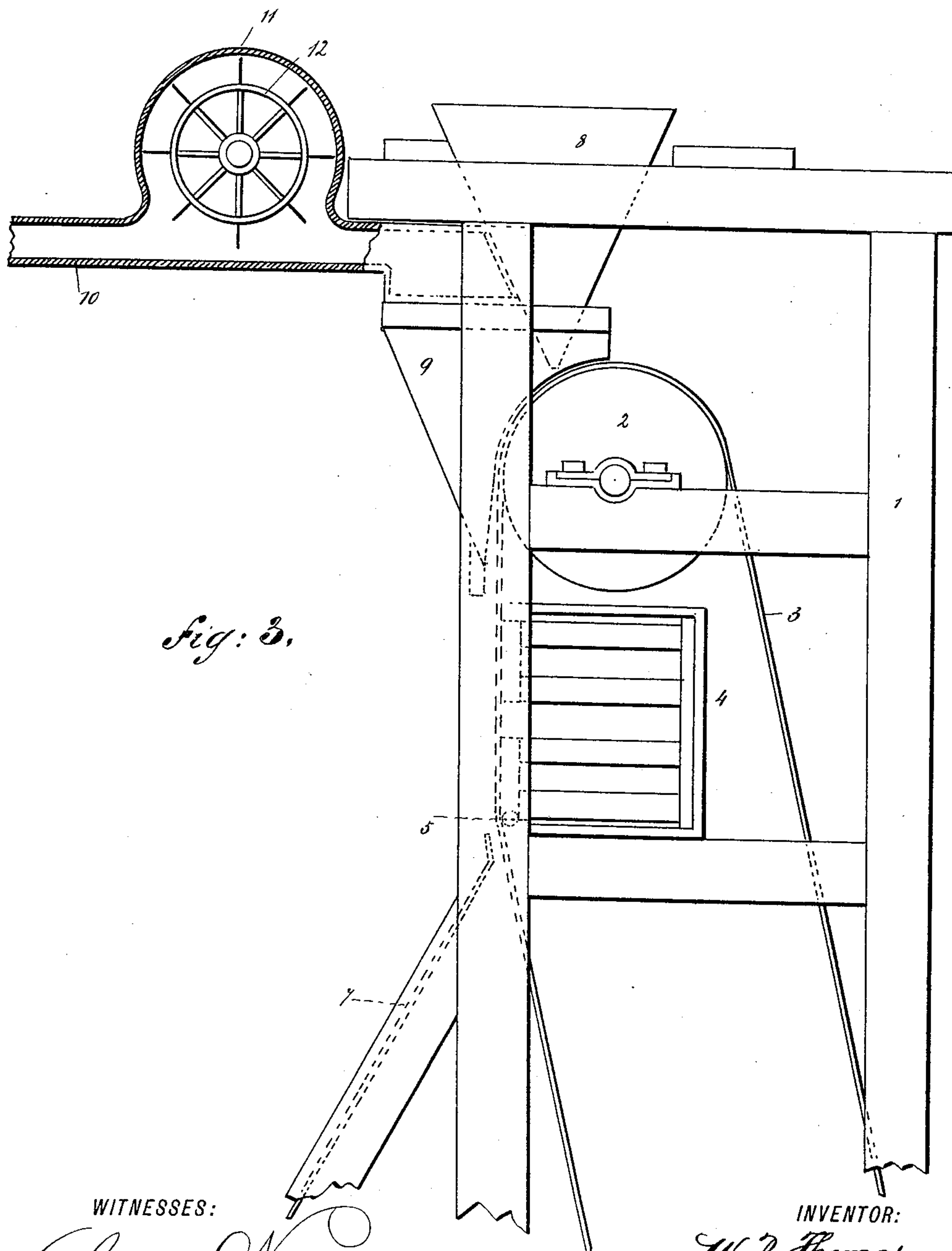
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# UNITED STATES PATENT OFFICE.

WILLIAM R. THOMAS, OF CATASAUQUA, PENNSYLVANIA.

## MAGNETIC ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 403,624, dated May 21, 1889.

Application filed March 30, 1889. Serial No. 305,378. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. THOMAS, of Catasauqua, in the county of Lehigh and State of Pennsylvania, have invented a new and Improved Magnetic Ore-Separator, of which the following is a full, clear, and exact description.

This invention relates to magnetic ore-separators, and has for its object to provide a magnetic ore-separator which will be effective in use.

The invention consists in an ore-separator constructed and arranged as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a front view, in elevation, of the invention. Fig. 2 is a side view, in vertical section, on the line  $x x$ , Fig. 1, with parts broken away; and Fig. 3 is a side view of the invention, partly in vertical section and broken away.

In the upper and lower parts of a suitable frame, 1, are mounted pulleys or wheels 2, over which extends an endless belt, 3. Beneath the upper pulley 2 is located a magnet, 4, over the face of which extends the endless band 3. The relative position of the pulleys 2 to each other and the magnet 4 is such that the face of the magnet and the periphery of the upper pulley 2 are about in the same vertical plane, while the lower pulley 2 is located at one side of a vertical plane extending through the magnet 4 and the upper pulley.

The result of the foregoing arrangement of positions is that the belt 3 extends down over the face of the magnet 4, over a roller, 5, and extends inwardly at an angle of about seventy degrees, passing down over the lower pulley 2, and up over the upper pulley 2. Beneath the lower pulley 2 is located a hopper, 6, to receive the concentrated ore as it drops off of the belt 3, and adjacent to the roller 5, at the bottom of the magnetic field, is located the upper end of a chute, 7, for carrying off the gangue.

Mounted in the top of frame 1 is a chute, 8, to receive the unconcentrated ore, having its lower end located adjacent to the belt 3,

and below and at one side of the bottom of said chute 8 is a directing-chute, 9, having its lower end terminating adjacent to the belt 3, about opposite the upper end of the magnetic field. Connecting with the upper portion of said chute 9, which is closed, is an air-tube, 10, having a chamber, 11, in which is located an exhaust-fan, 12, for drawing dust from the chute 9.

The operation of the device is as follows: Unconcentrated ore is placed in the chute 8, and drops onto the belt 3, passing over the upper pulley 2. The ore is thrown from the belt 3, which is traveling about four hundred feet a minute, against the directing-chute 9, breaking the particles apart and by so doing avoiding clustering, which is very objectionable. After the particles of ore are thus broken apart, the ore drops down through the directing-chute 8 in a thin sheet to the face of the magnet, and is there attracted to the belt and adheres to it until it is carried out of the magnetic field, when it drops into the hopper 6. The gangue falls down vertically from the belt 3, onto and down over the chute 7, to a suitable receptacle. As the unconcentrated ore is thrown from the belt 3 onto the directing-chute 9, the exhaust-fan 12, driven by suitable power, carries away the fine dust in said chute 9, through the tube 10, and thereby being separated from the iron gives the latter a better appearance after it has been separated from the gangue.

The fan 12 and tube 10 are preferably located at the top of the chute 9 and above the lower end of the chute 8, as in this position the dust is more thoroughly separated.

By means of this invention, constructed and arranged as herein set forth, ore may be effectively separated from the gangue.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. An ore-separator consisting of an endless belt mounted on upper and lower pulleys, a supply-chute having its lower open end located above the upper pulley and endless belt, a directing-chute closed at the top and open at its lower end opposite the upper pulley and endless belt, a magnet having its field located adjacent to and behind the vertically-descending portion of the endless belt,



a chute having its upper end located adjacent to the bottom of the field of the magnet and in front of the endless belt, with a passage-way between the chute and belt, a hopper located beneath the lower pulley and the endless belt, a suction air-tube connected to the closed top of the directing-chute, and an exhaust-fan located in a chamber opening into the suction-tube, substantially as shown and described.

2. In an ore-separator, a magnet, an endless belt passing over upper and lower pulleys and vertically downward over the field of the magnet, a receiving-chute having its lower open end located above the upper roller and endless belt, a directing-chute having its lower open portion opposite the upper pulley and endless belt, a chute having its upper end located opposite the bottom of the magnetic field, with a passage-way between the endless belt and the chute, and a receptacle beneath the lower pulley and endless belt, substantially as shown and described.

3. In an ore-separator, the magnet 4, the endless belt 3, extending over the upper and lower pulleys, 2, the latter being in different vertical planes, and the belt 3, moving downward over the magnetic field, passing over a pulley, 5, at the bottom of the magnetic field

and extending rearward at an angle over the lower pulley 2, the receiving-hopper 8, opening onto the belt 3, above the upper pulley 2, the directing-chute 9, open at its lower end opposite the belt 3, passing over the upper pulley 2, and the chute 7, having its upper end located opposite the belt 3, beneath the pulley 5, with a passage-way between the belt 3 and said chute 7, substantially as shown and described.

4. An ore-separator consisting of a vertical endless belt, a magnet having its field located behind the vertically-descending portion of the endless belt, a receiving-chute opening onto the endless belt above its upper roller, a directing-chute with closed top open at its lower portion opposite the endless belt and its upper roller, a chute having its upper end located opposite to the endless belt below the field of the magnet, with a passage-way between the belt and chute and an air-exhaust tube, and mechanism connected with the upper end of the directing-chute, substantially as shown and described.

W. R. THOMAS.

Witnesses:

DANIEL WILSON,  
R. CLAY HAMERSLY.