A. W. SCHELL.

Shaking Machine for Separating Ores.

No. 37,888. Patented March 10, 1863.

Fig. 2

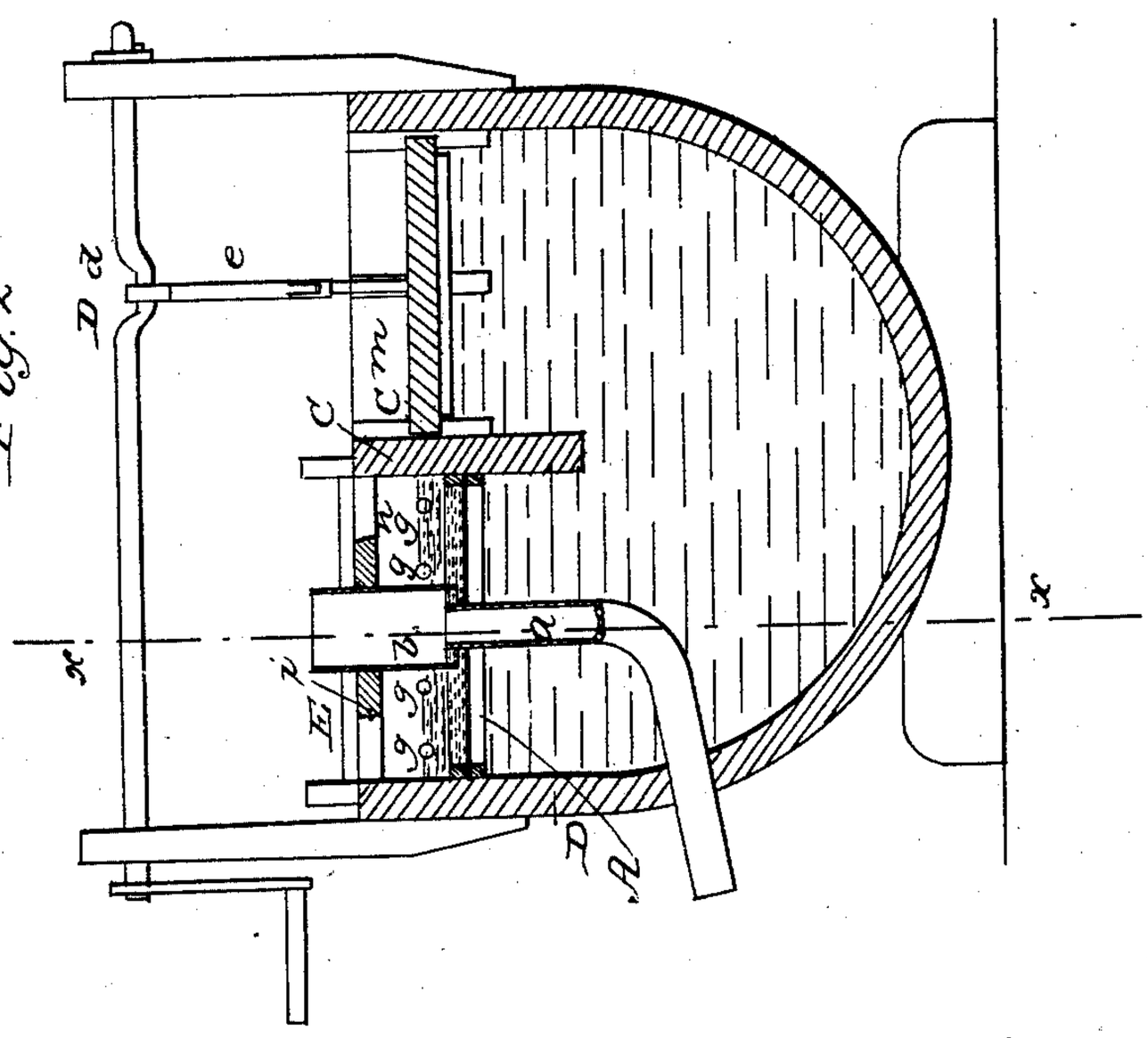
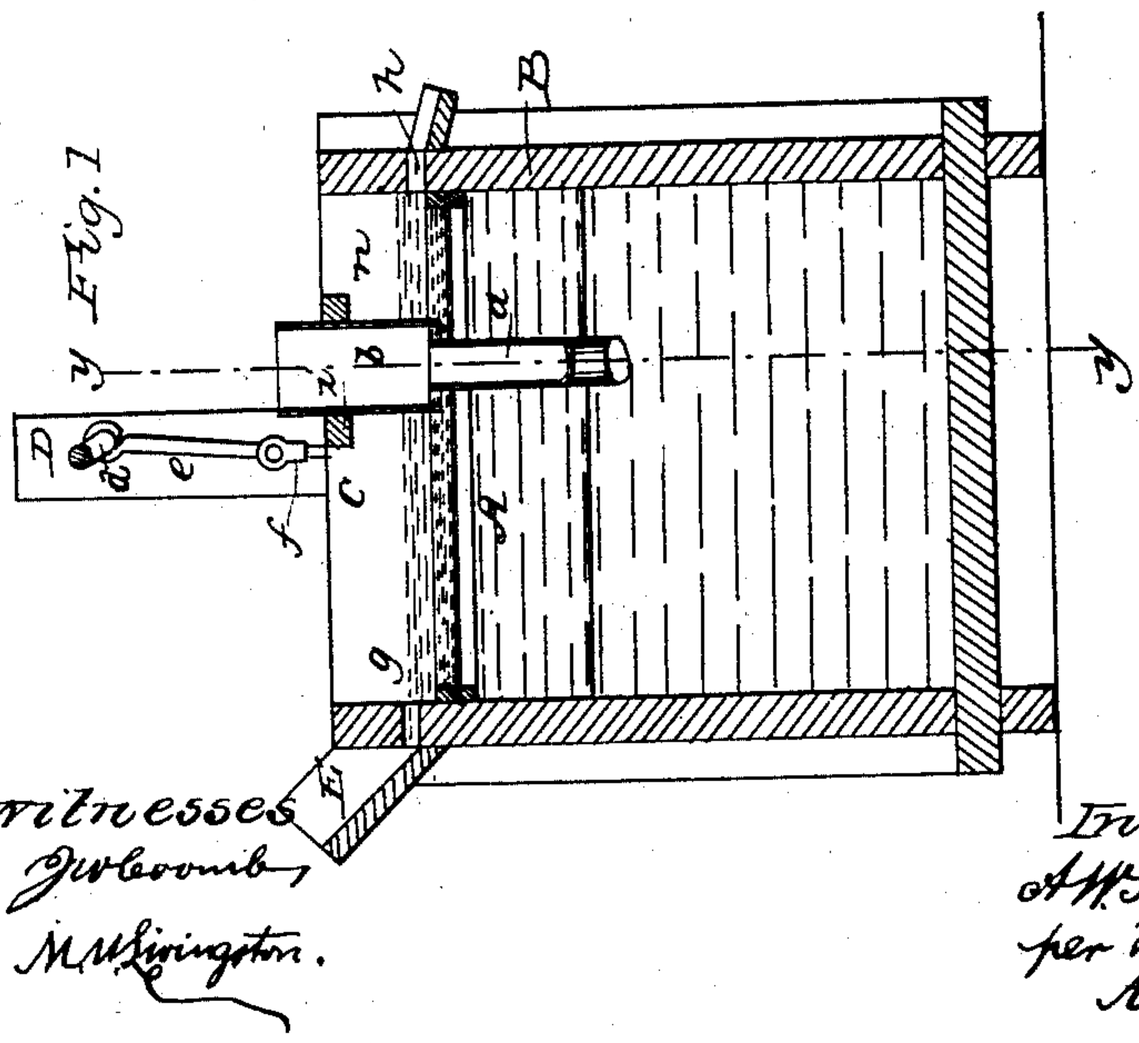


Fig. 1



Witnesses
J. W. Coombs,
M. M. Livingston.

Inventor
A. W. Schell.
per Munn & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

AUGUST WILHE. SCHELL, OF CLAUSTHAL, HANOVER, A SIGNOR TO GEORGE ASMUS, OF HOUGHTON, MICHIGAN.

IMPROVED SHAKING-MACHINE FOR SEPARATING ORES.

Specification forming part of Letters Patent No. **37,888**, dated March 10, 1863.

To all whom it may concern:

Be it known that I, AUGUST W. SCHELL, of Clausthal, in the Kingdom of Hanover, have invented a new and Improved Self-Acting Shaking-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a transverse vertical section of my invention, the line *x x*, Fig. 2, indicating the plane of section. Fig. 2 is a longitudinal vertical section of the same, taken in the plane indicated by the line *y y* in Fig. 1, and looking in the direction of the arrow opposite to that line.

Similar letters of reference in both views indicate corresponding parts.

The object of this invention is to separate the different substances contained in a certain ore, according to their specific gravity, simply by the motion of the water and without any attention on the part of the operator.

The invention consists in the arrangement of a tube extending through the sieve a short distance up into a cylindrical jacket, in combination with said sieve and with a suitable agitator in such a manner that the heaviest particles contained in the ore, which precipitate first to the sieve, close up the access to the tube within the cylindrical jacket, and only such particles are allowed to escape through said tube the specific gravity of which is equal to that of the first sediment.

To enable those skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings.

A represents the sieve of a shaking-machine, said sieve being secured in a horizontal position in a box, B, of wood or any other suitable material. This box is divided in two compartments, *n m*, by a vertical partition, *c*, one compartment being occupied by the sieve A and the other by a plunger, C, to which a reciprocating rising-and-falling motion is imparted by means of a crank-shaft, D, the crank *d* of which connects by a rod, *e*, with the stem *f* of the plunger. If the box B is filled with water or other liquid, the motion of the plunger causes the liquid to pass alternately up and down through the sieve A. It is obvious, however, that motion may be imparted to the plunger by other means besides those above specified. The ore is introduced to the sieve through a hopper, E, on the side of the box B, and through apertures *g*, and it discharges partially through a sluice, *h*, opposite the hopper, and partially through a tube, *a*, which extends up through the sieve and out through the side of the box B, as clearly shown in Fig. 2 of the drawings. The upper end of this tube rises from one-half to one inch above the surface of the sieve, according to the size of the ore to be treated, and it is surrounded by a cylindrical jacket, *b*, which is sustained by a cross-bar, *i*, and which extends down to within one-eighth of an inch of the sieve, or nearly so.

The operation is as follows: The grains of ore placed upon the sieve are moved up and down as soon as the plunger commences to play in the box filled with water, and on precipitating said grains arrange themselves according to the specific gravity, the heaviest grains below, the lightest above. Thus far an ordinary plunger shaking-machine separates the ore; but the grains of different specific gravity have to be separated by hand, and the operation requires much time and great care of the operator.

By my apparatus the separation of the grains of different specific gravity is performed automatically in the following manner: At the beginning of the work the sieve is covered with the heaviest grains contained in the ore to a level with the top of the tube *a*, thereby closing the space between the jacket *b* and the sieve. If now the mixed ore is admitted through the hopper, and at the same time the plunger commences to operate, the heaviest grains in the ore arrange themselves below in the ordinary manner, and they mingle with the layer which has been previously spread on the sieve, and which is of equal specific gravity. On account of the continuous up-and-down motion this layer will be of an uniform depth all over, an uneven accumulation of grains at any one spot being impossible, and as soon as the depth of the layer exceeds the height of that portion of the tube *a* which projects above the sieve the heavy grains commence to discharge through said tube, the lighter grains being prevented from passing under the lower edge of the jacket *b* to the mouth of said tube. The light grains are carried off through the

sluice *h*, while those grains which have the desired specific gravity find their way out through the tube *a*. If it is desired to again separate that portion of the ore which discharges through the sluice *h*, said portion is conducted to a second shaking-machine of the same construction, the sieve being covered with grains of less specific gravity than that in the first machine, and a second separation takes place precisely in the same manner as above described. It is obvious that by these means the separation can be carried on to any desired extent with the greatest ease and facility.

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

The employment or use of the tube *a* and cylindrical jacket *b*, in combination with the sieve A of a shaking-machine, constructed and operating substantially as and for the purpose herein shown and described.

AUG. WILHE. SCHELL.

Witnesses:

GEORGE MORITZ,

HEINR. AUGUST SCHÜLER.