

A. ALLAIN & A. R. DEJEAN.

ORE-WASHER.

No. 170,978.

Patented Dec. 14, 1875.

Fig. 1.



Fig. 2.

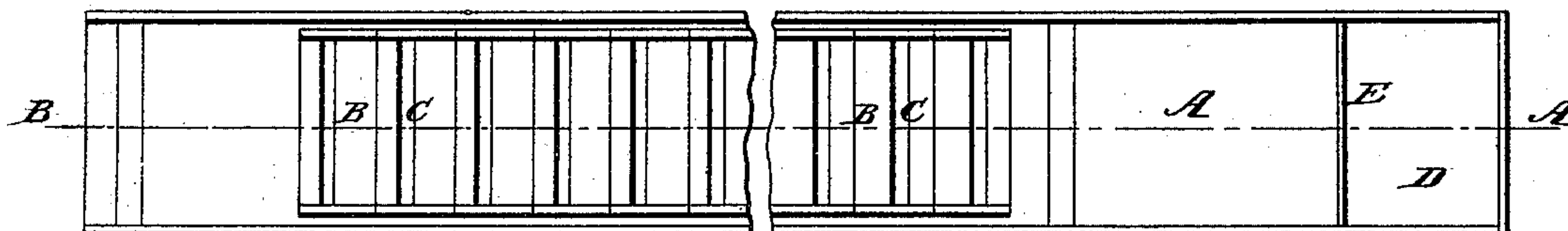


Fig. 4.

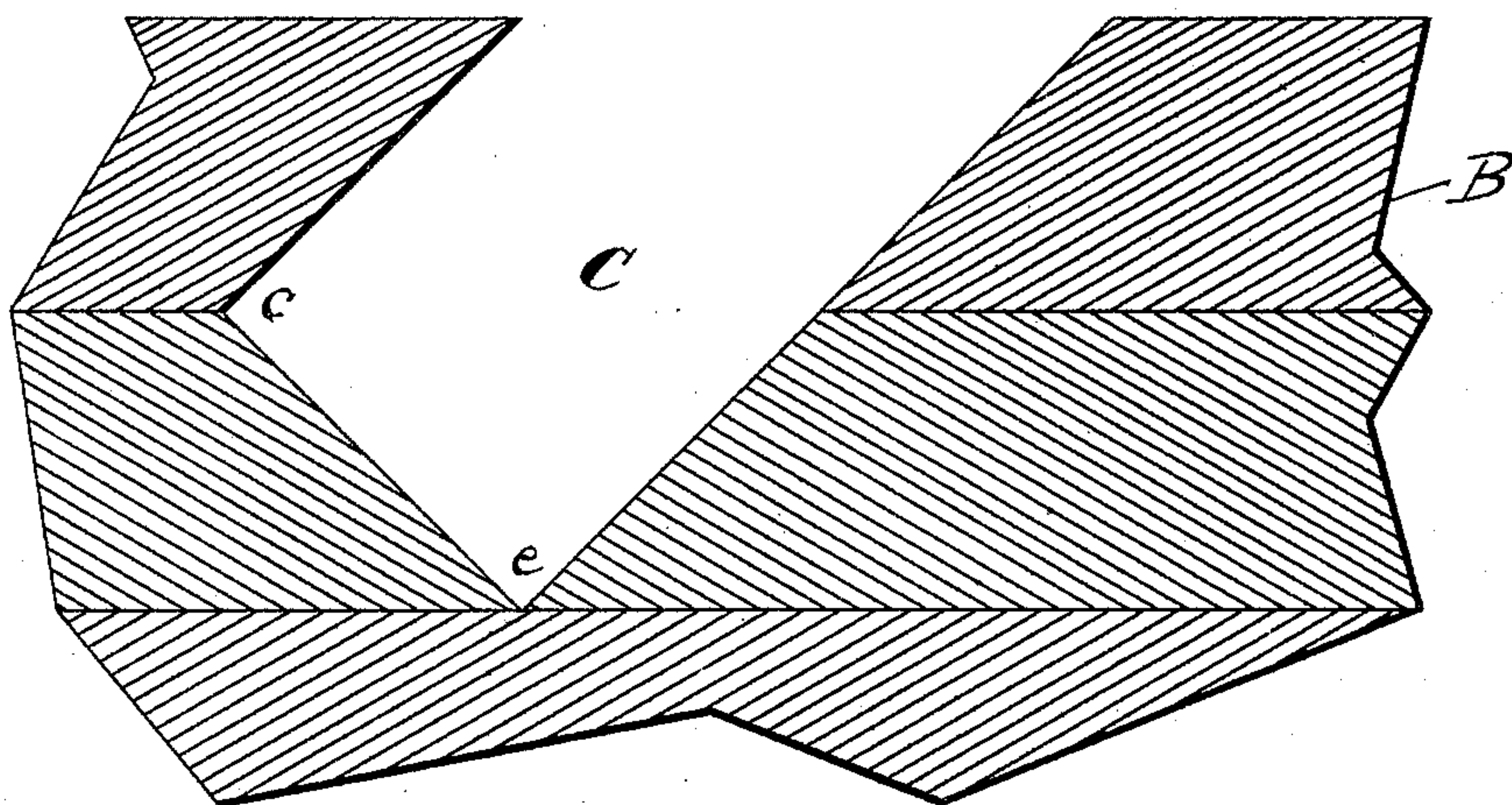
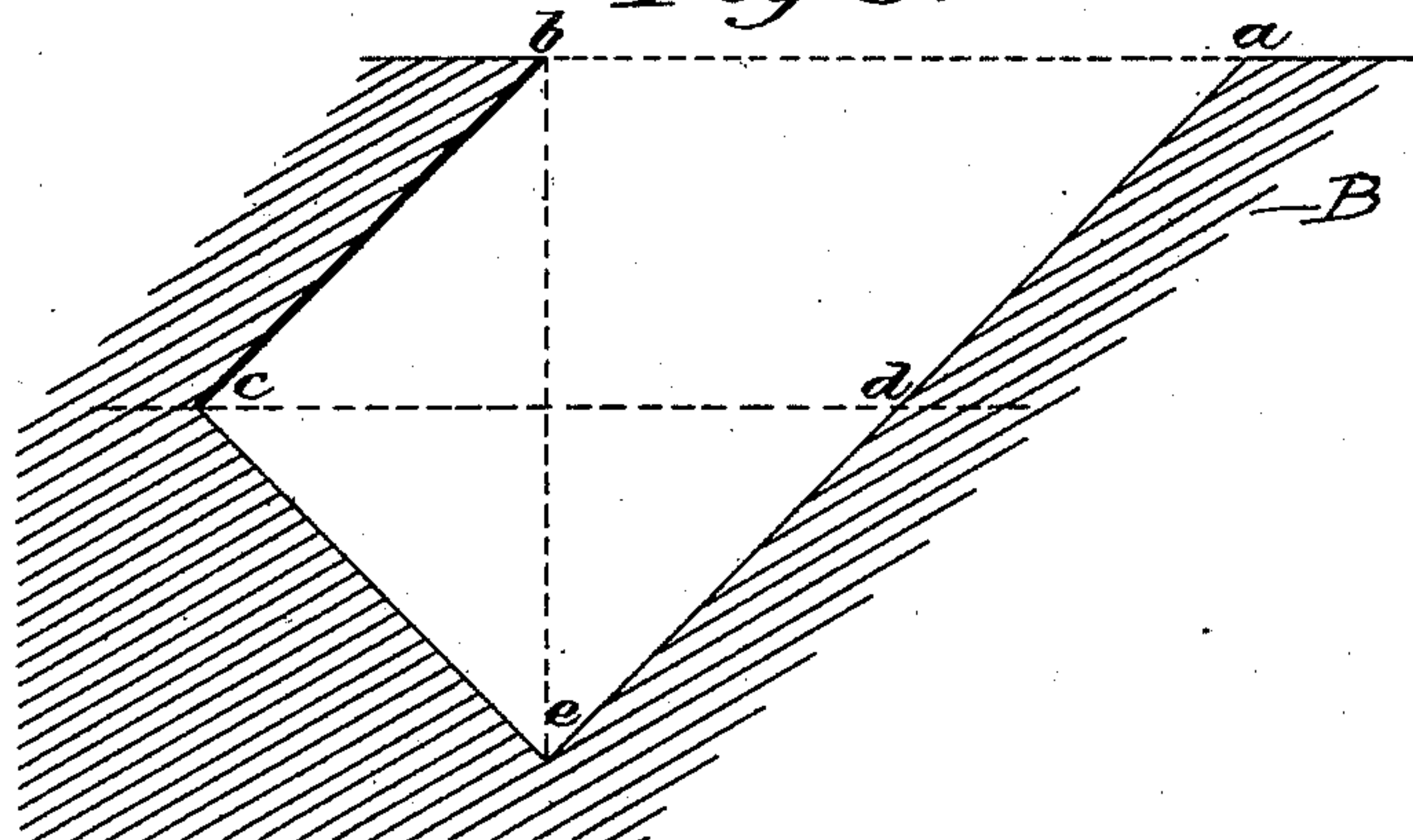


Fig. 3.



Witnesses.

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IMPROVEMENT IN ORE-WASHERS.

Specification forming part of Letters Patent No. **170,978**, dated December 14, 1875; application filed February 28, 1873.

To all whom it may concern:

Be it known that we, ALPHONSE ALLAIN, of Paris, in the Department of the Seine, and ALFRED RIVIÈRE DEJEAN, of Alais, in the Department of the Gard, both in the Republic of France, have invented certain Improvements in Apparatus for Washing Alluvions and Auriferous Earths, of which the following is a specification:

Our invention relates to a system of washing alluvions and auriferous earths, which may be termed the system of fixed angles, having for principle a cavity, represented by a parallelogram united at its base with a triangle, preferably an isosceles, and the lines of which have always an angle of from forty to fifty degrees—that is to say, a mean of forty-five degrees.

Figure 1 of the accompanying sheet of drawing is a vertical section at A B, Fig. 2, of an apparatus embodying our invention. Fig. 2 is a horizontal section of same. Fig. 3 is a diagram, illustrating the principle of formation of a cavity or groove, according to our invention; and Fig. 4 a groove or cavity embodying our invention.

The apparatus consists of a long box or trough, combining a puddling-compartment, A, and a washing-table, B, having hollow transversal grooves or cavities C, of a geometrical and fixed shape, (hence the designation of apparatus with fixed angles,) each of these grooves resulting, as above stated, from a parallelogram, and a triangle of any kind, the common base of which is the lower main line of the parallelogram, the said cavity being summed up by the figure represented by the lines *a b c d d a d e e c*, Fig. 3, of the drawing.

The fore part of the box forms a water-tank, D, separated by a movable sluice-gate, E, from a second compartment, constituting a puddling-trough without mechanism of any kind, and the extended part, which follows, receives the washing-table, composed of several segments, which it is only necessary to place by hand on the bottom of the box to form the table. Each segment has a hollow groove. The apparatus thus combined may rest upon two wheels, and be moved from place to place, like a hand-barrow, or be drawn by a horse.

The entire apparatus may be made of wood, using boards of equal thickness, held together by screws. The thick parts, such as the segments, may be formed by the union of several boards, and the grooves (see drawing, Figs. 3 and 4) be obtained by the juxtaposition of boards cut at one of their ends to an oblique face, giving a fixed angle. This carefully-studied arrangement renders the construction and repair of the apparatus very simple. It further affords the advantage of resisting the tendency to warp, common to all apparatuses alternately wet and exposed dry to the heat of a burning sun.

The mode of construction above described is that which is preferred, but it will be evident that other material might be used, and combination of the parts be otherwise effected while retaining the main features of this invention.

Working of the apparatus.—The apparatus being brought to the soil to be washed and to the stream of water, the requisite inclination is given to it, say from ten to fourteen degrees, according to the quantity of water at command, the nature of the soil and of the metallic particles, whether in dust, nuggets, or other form. This is done by resting upon the ground the end of the box opposite to that at which the water is admitted, and, if necessary, the ground is slightly hollowed with a shovel, either under the wheels to lessen the inclination, or under the end of the table, to increase it. After having introduced a suitable quantity of water, which is regulated by the sluice-gate E, the earth to be washed is shoveled into the puddler A. The soil to be washed is taken into the apparatus as it comes, stones, earth, sand, without sorting or rejection. The coarse sieve found at the head of all apparatuses for gold-washing is not here considered necessary, but deemed a complication, of which the safety of the grooves permits the suppression.

The water passing beneath the sluice-gate attacks the mass to be puddled, its action being assisted and directed by the labor of a workman armed with an iron scraper. During the puddling the matters are drawn beyond the projection or partition separating the puddler from the table B, and undergo the

action of the table B, and of its grooves C. When the puddling leaves no fear of carrying forward entire lumps or balls of earth, the workman, by means of his scraper, causes the entire mass to pass onto the table, precipitating this forward movement with a roughness of manœuver, and an absence of precaution, which render the work very simple and very rapid.

While the operation is progressing the action of the scraper is brought at one time onto the puddling; at another onto the cleansing of the table. This extreme facility of this work results from an absolute dependence upon the grooves for the retention of the metallic particles. It will be understood that the greater the number of grooves the faster the working may be conducted without increasing the losses of metal.

The operation, usually continuous, may be arrested by simply stopping the flow of water and ceasing to scrape, the operation being recommenced at the point at which it was arrested. When it is desired to end the operation, a stronger flow of water is given by lifting the sluice-gate sufficiently to sweep away all that is on the table outside the grooves. A corner of the scraper is even passed into the grooves, to cause the major part of the gravel and stones to pass out, leaving the sand retained at its maximum of richness.

The operation is finally stopped when the sand in the grooves is deemed sufficiently enriched to render further outflow dangerous. Practice alone can fix the limit to be chosen for each kind of auriferous earth.

Each segment carrying a groove is then removed by hand, and plunged into a trough full of water in such manner as to cause the fall of the enriched sand. The products of the grooves, and that of the last washing or scouring of the table, are considered rich and are preserved to be further treated in a finishing apparatus, such as the washing pan or bowl.

At the end of each day the segments are removed and the box washed, care being taken to introduce the water in such a manner as to collect the particles of metal which may have entered the joint. This will yield a few more quarts of sand to be treated.

Technical details.—We deem it desirable to further dilate upon the play of the grooves, in order to show how this apparatus, notwithstanding its apparent and real simplicity, borrows from the complicated apparatuses hither-

to used in the mechanical preparation of ores their most fruitful principles.

After the puddling the matters carried or pushed onto the table undergo the action of a series of elements of fixed table and a series of grooves. The water which descends onto the table divides into two sheets, the work of each being very different—the first, superficial and continuous, carries with it all the light bodies, and all those which offer sufficient surface to the shock; the second sheet undergoes a succession of reflexes and eddyings as it meets the grooves. The first therefore tends to classify, by density, the naturally heavy matters, and the second strives to classify by equal fall, delivering to the continuous stream of the superficial sheet all the matters which may issue from the grooves, or simply rise to the zone of forward impulsion. The various cases which may arise cannot here be discussed, but persons familiarized with the apparatuses of mechanical treatment will, with slight consideration, realize that the soils to be washed are submitted in this apparatus to the double and repeated action of a fixed table, and a series of small rudimentary sieves. The grooves really act like small continuous sieves, and, further, they cover the metallic substances like “pointed boxes,” or boxes with grooves coming to a single point.

It is only necessary to mention these latter to render apparent the favorable influence of the lower angles of the grooves. The result obtained under such simple conditions is due to the great difference in density between gold and stony matters. It is sufficient that the movement be started in a favorable direction to effect the separation with certainty, notwithstanding the presence of pieces of very different dimensions.

We do not limit ourselves to the use of any particular material in the construction of our washing apparatus; but we claim as our invention—

The segmental and stationary table B, having in each segment one or more grooves, C, of angles, as specified, and reverted toward the fore part of the table, as and for the purpose described.

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Witnesses:

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