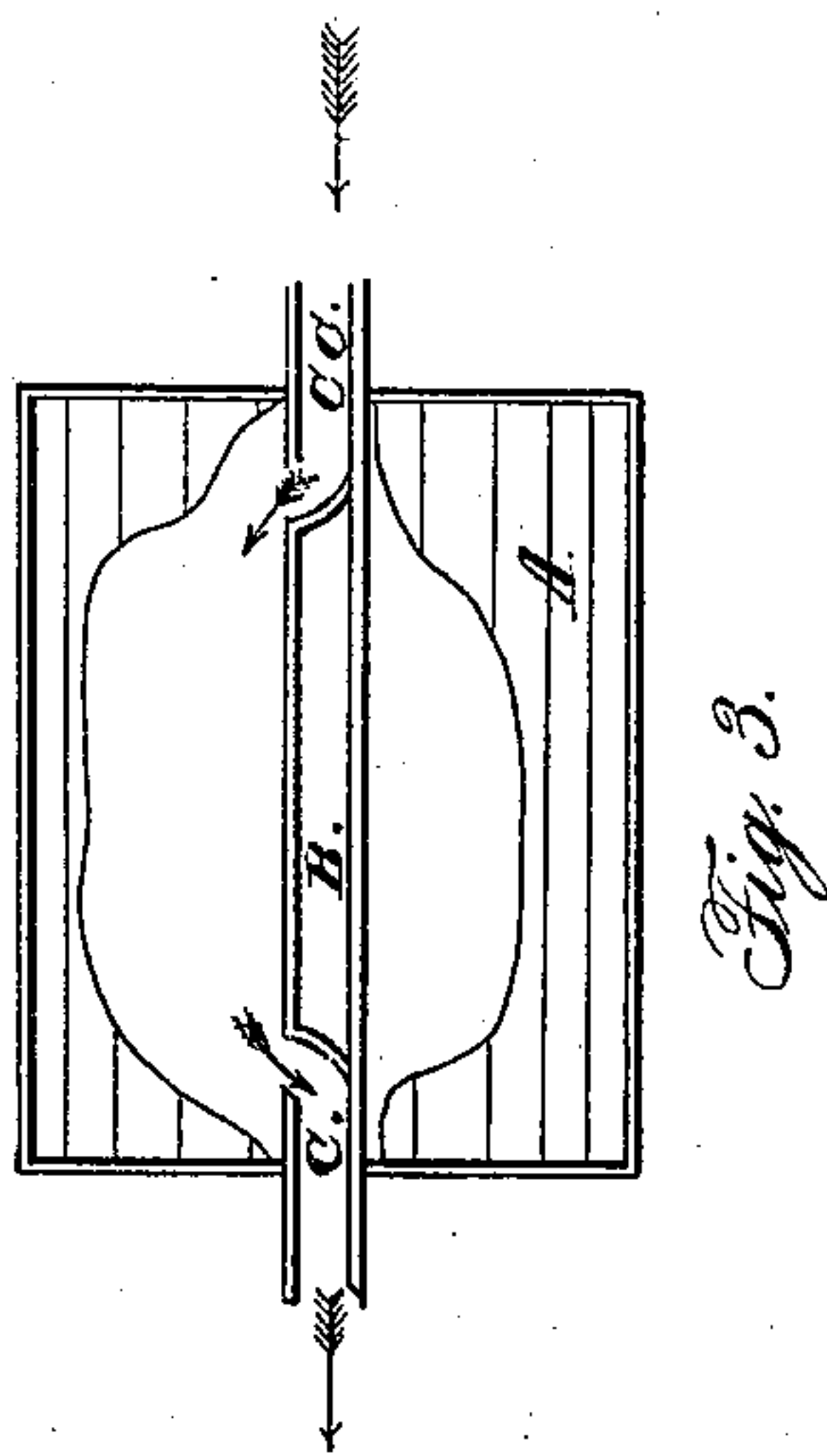
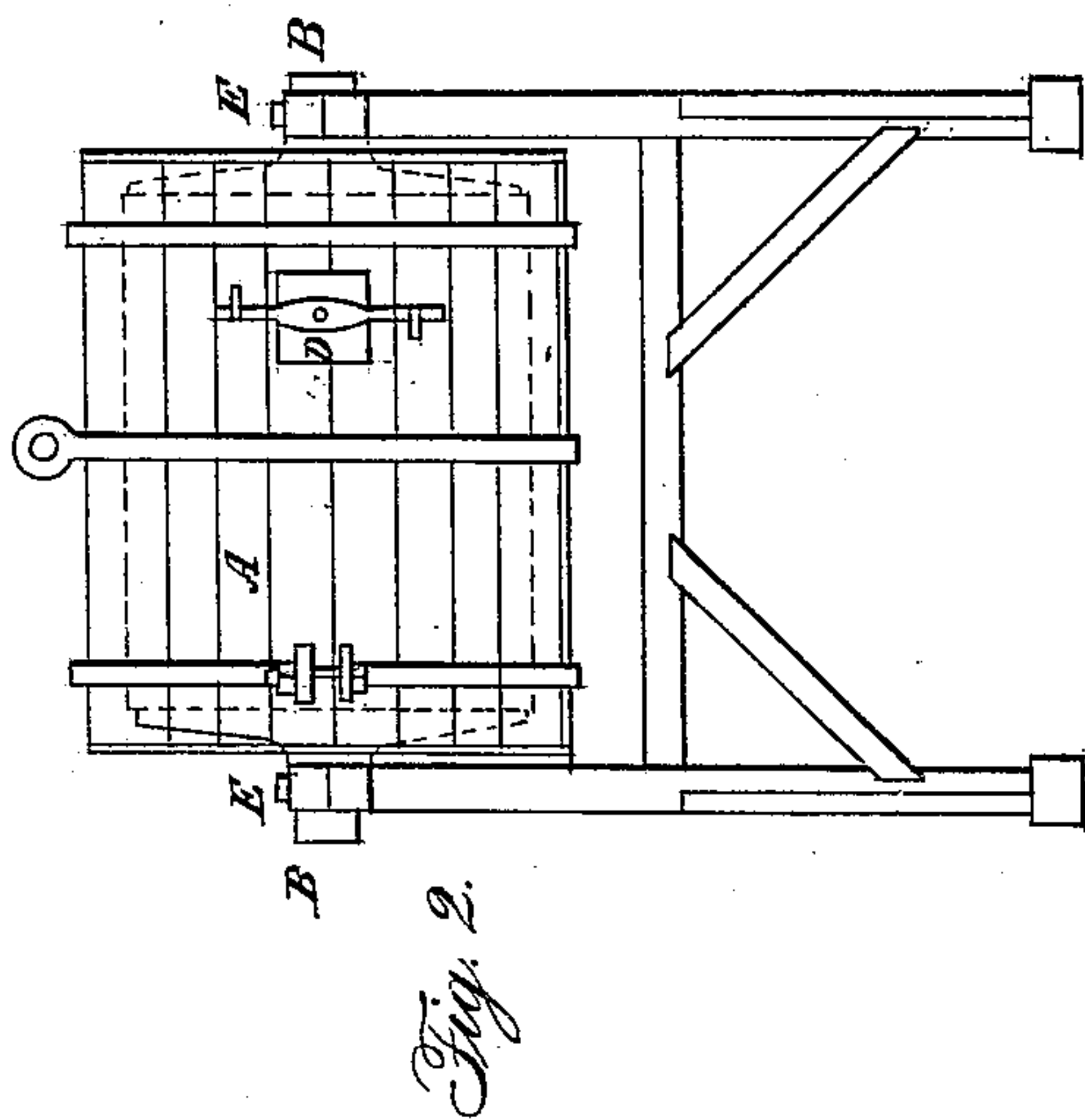
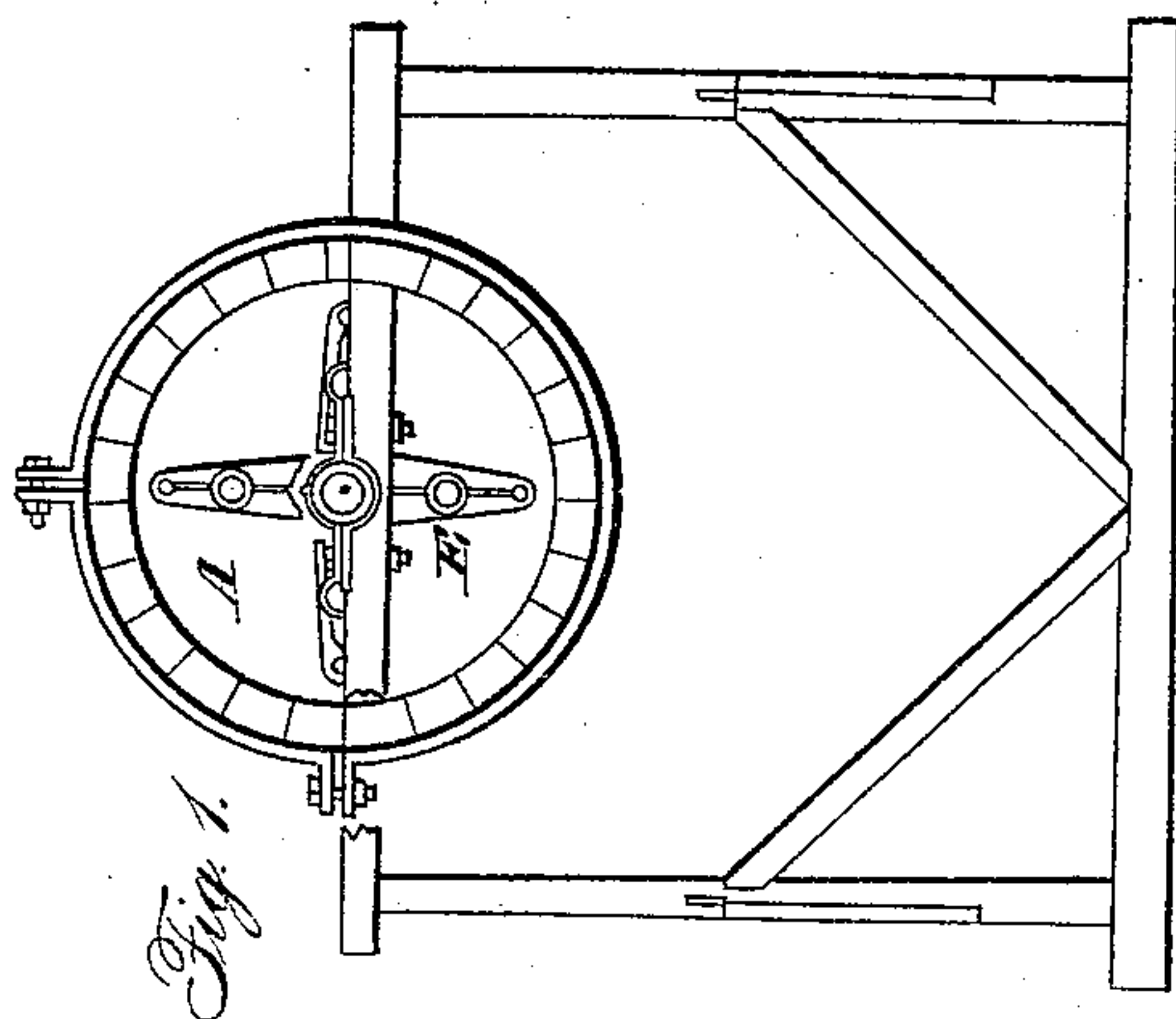


F. N. DU BOIS.  
Ore Amalgamator.

No. 53,590.

Patented Apr. 3, 1866.



Witnesses:

*W. E. Hullcut*  
*H. B. Hullcut*

Inventor:

*F. N. Du Bois*

# UNITED STATES PATENT OFFICE.

F. N. DU BOIS, OF BLACK HAWK, COLORADO.

## IMPROVED PROCESS FOR AMALGAMATING GOLD, &c.

Specification forming part of Letters Patent No. 53,590, dated April 3, 1866.

*To all whom it may concern:*

Be it known that I, F. N. DU BOIS, of Black Hawk, in the county of Gilpin, in the Territory of Colorado, have invented a new and useful Improvement in a Method for Amalgamating Gold; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 represents a side elevation. Fig. 2 represents an end elevation. Fig. 3 represents a cross-section view of the interior shaft.

Similar letters of reference in each of the several figures indicate corresponding parts.

The nature of my invention consists, first, in the use of the amalgamating-cylinder A; and, second, in the hollow wooden shaft or axle B, through which water is flowed for the purpose of discharging the ore after the gold has been amalgamated from it.

To enable others skilled in the art to make and use my invention, I proceed to describe its construction and operation.

The cylinder A, being of any convenient size, is to be constructed of wood with iron hoops. The shaft B, also of wood, is firmly fixed in the cylinder through the direction of its axis and revolves with the cylinder, resting on the journals E, the necessary power for revolving it being communicated by any convenient means.

The cylinder is to be filled to about two-fifths of its capacity with a charge consisting of the following materials and proportions, substantially: One-half ton of finely-ground desulphurized ore, about one hundred and fifty pounds of broken fragments of any kind of hard rock, not to exceed in size one and a half inch in diameter; also about two hundred and fifty ounces of an amalgam, consisting of mercury and the gold ordinarily obtained from the ore, which amalgam must at all times be maintained in such proportion of mercury and gold as to have a consistency about midway between a fluid and solid condition.

The above charge is introduced in the cylinder A through the opening D, together with a quantity of water sufficient to reduce the ore to the condition of a semi-fluid pulp. The opening D being then closed, the cylinder is revolved at a speed sufficient to produce the

greatest amount of grinding effect from the fragments of rock and admixture of the material contained in the cylinder. The effect then produced is that the attrition of the fragments of rock grinds the ore and scours and brightens the particles of gold preparatory to their being picked up and held by the amalgam; and the nature of the amalgam is such that it does not divide into infinitely small particles, as liquid mercury does, and float away with the water beyond any possibility of being collected, but the amalgam retains its identity and consistency under any amount of agitation, being only divided into lumps and pieces, which diffuse themselves among the mass of ore and collect and hold the gold, which usually exists in the form of minute metallic particles.

There is also another point to be noticed. The nature of liquid mercury is such that it is entirely devoid of capillary attraction. It assumes the globular form, and is rather disposed to repel than to come in contact with particles of gold; but the presence of gold with the mercury in a state of amalgam not only destroys this tendency of the mercury to repel, but greatly facilitates its ability to adhere to and amalgamate the particles of gold.

The cylinder having been revolved for a time varying from six to twenty-four hours, according as the gold in the different ores requires more or less scouring, and the amalgamation being completed, a stream of water is introduced into the shaft B, Fig. 3, by applying a pipe with a water-tight joint to the opening C C in the end, causing the water to flow in the direction of the arrows until it enters the cylinder, where it mixes with the pulpy ore and dilutes it, so that it flows off with the water through the opening C in the opposite end of the shaft. During the operation the cylinder continues to revolve, and the ore is all flowed out with the water, while the fragments of rock and amalgam, being very heavy, remain in the cylinder. The cylinder is now stopped, and, the water being drained off a new charge of ore is introduced and the operation proceeded with as at first, except that thereafter ore and water only are introduced, and more fragments of rock are added as those already in are worn away, and as the amalgam becomes too stiff by its collecting gold it is softened to the proper consistency by the ad-



dition of more mercury, and as the amount of amalgam accumulates the surplus is from time to time removed from the cylinder, the whole forming a new and useful improvement in method for saving gold.

I do not claim as my invention either the cylinder or the hollow shaft through it, or the use of them in combination; but

What I do claim as my invention, and desire to secure by Letters Patent, is simply—

The use of an amalgam of gold and mercury

substantially of such consistency as to render it adaptable for the purpose set forth.

The above specification of my improvement in method for amalgamating gold signed by me this 12th day of September, in the year 1865.

F. N. DU BOIS.

Witnesses:

J. W. NESMITH,  
WILLIAM ARMOR.