

A. M. CHURCH.
Ore Amalgamator.

No. 22,704.

Patented Jan. 25, 1859.

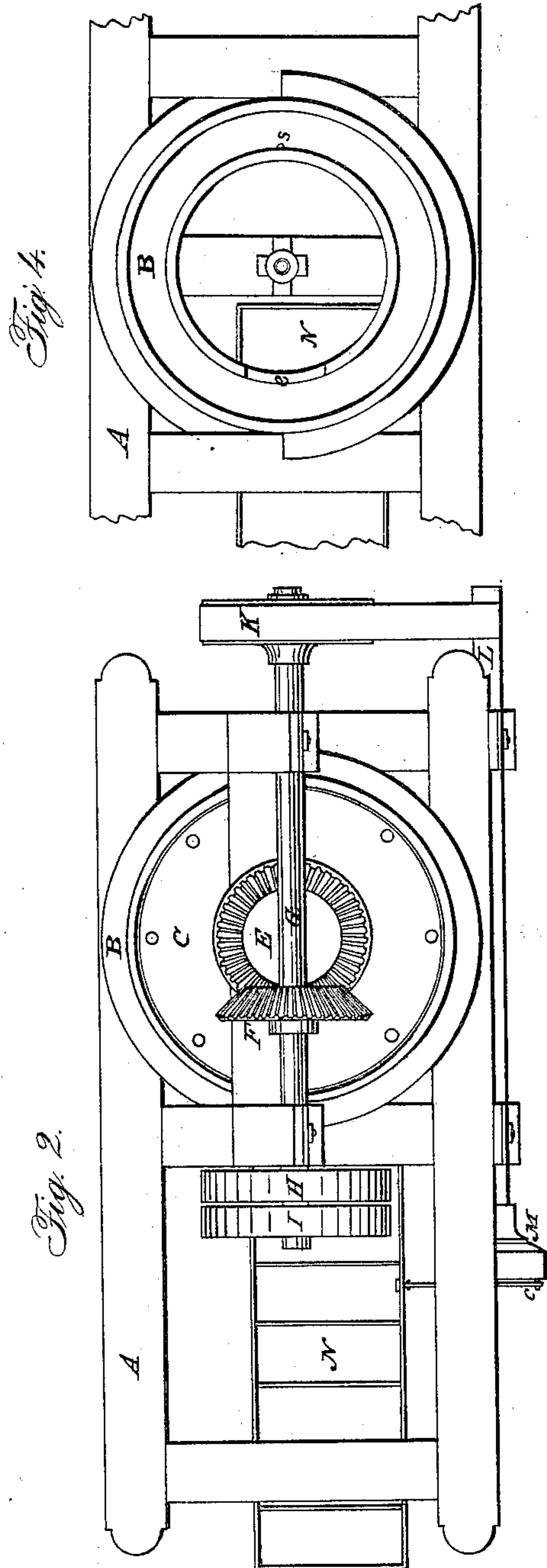
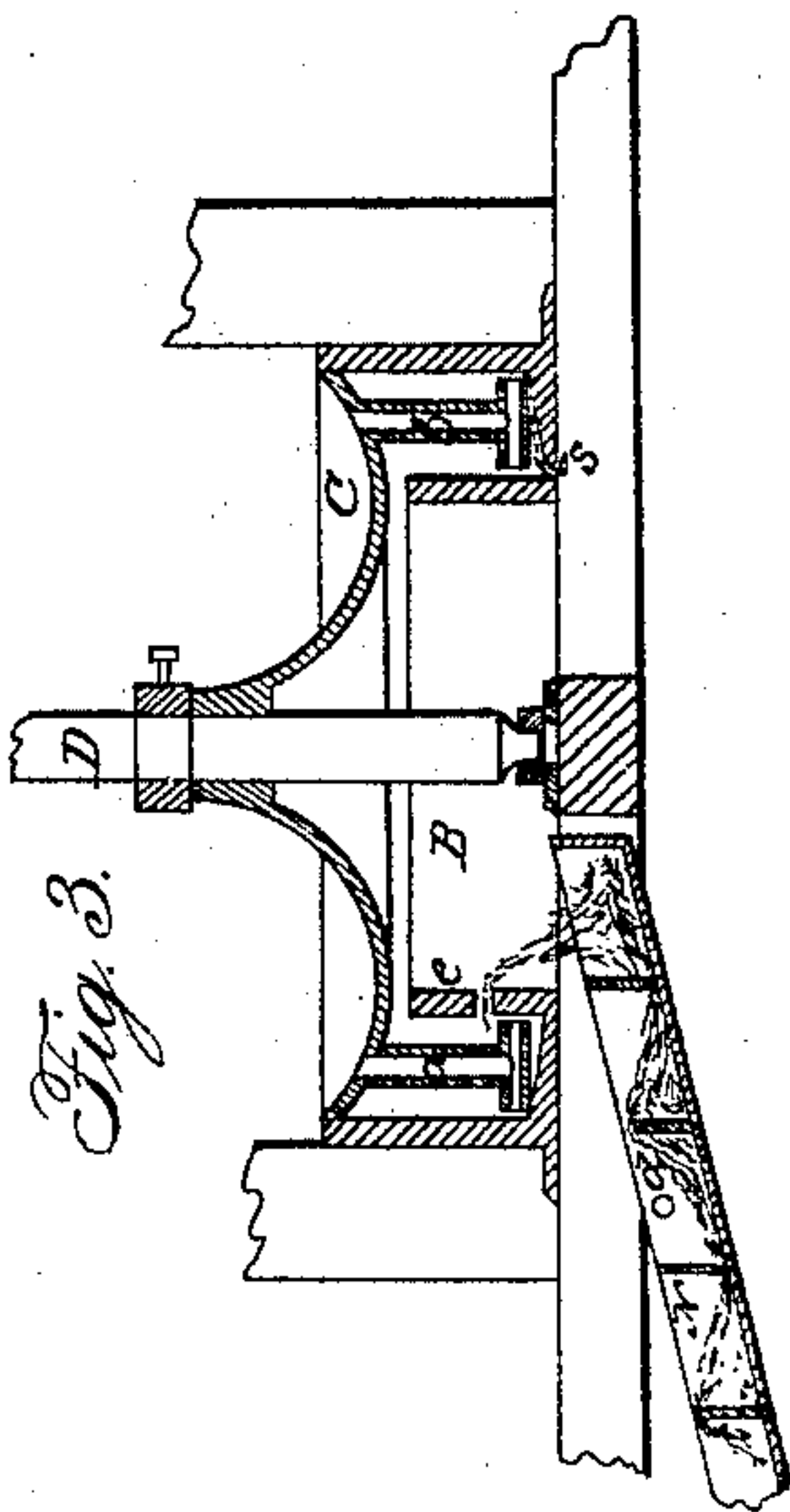
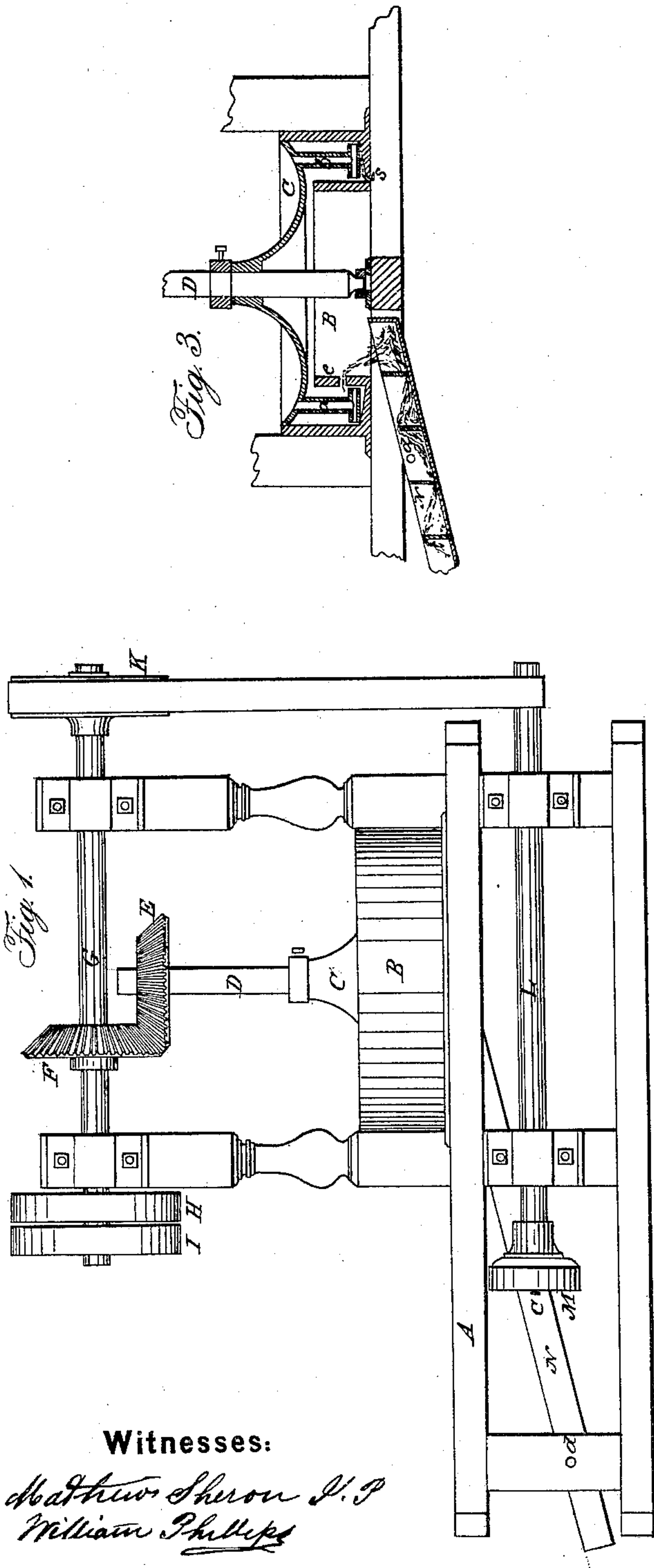
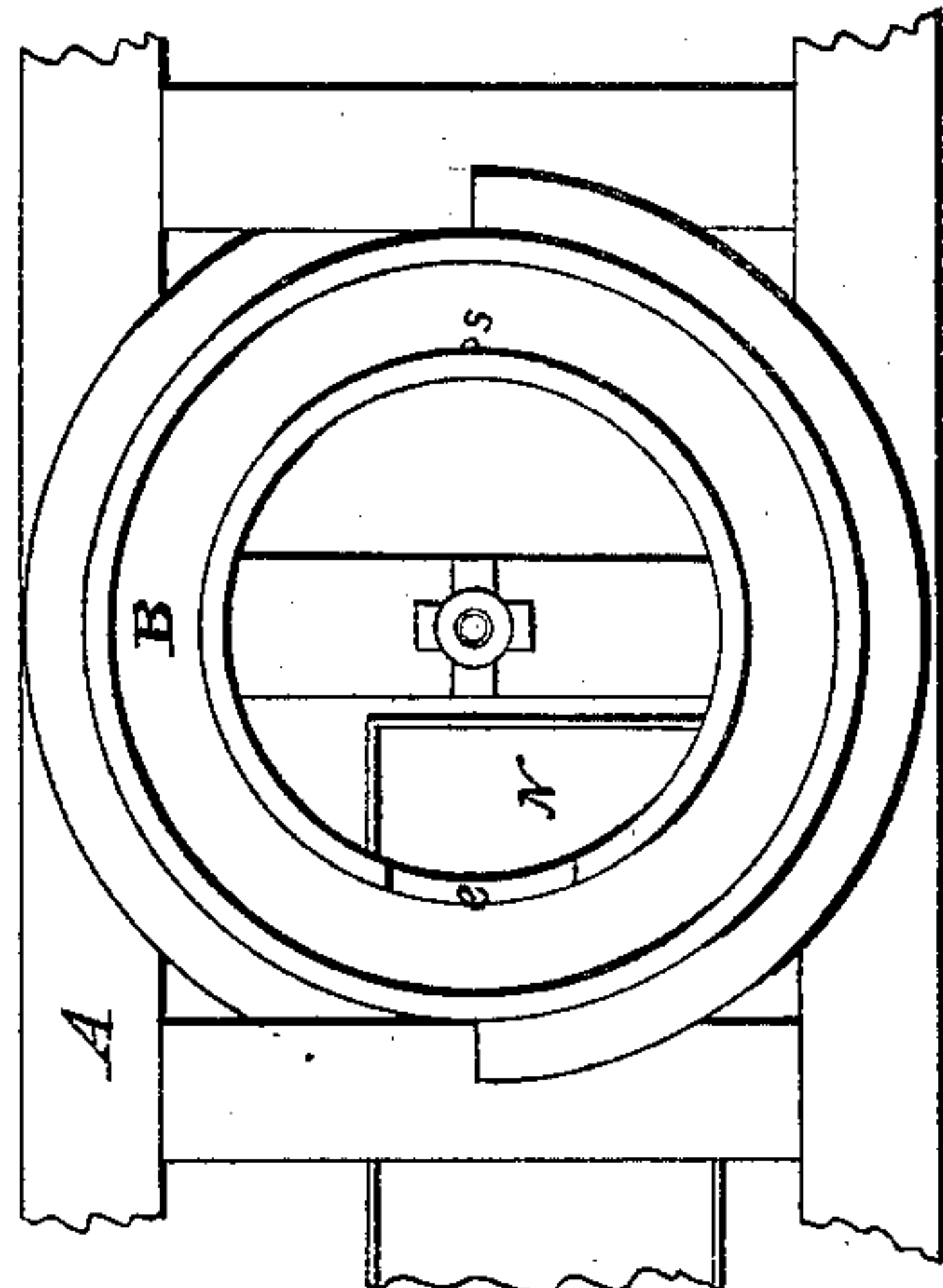


Fig. 4.



Witnesses:

Mathew Sheron S. P.
William Phillips

Inventor:

Augustus M. Church

UNITED STATES PATENT OFFICE.

A. M. CHURCH, OF AUGUSTA, GEORGIA.

AMALGAMATOR.

Specification of Letters Patent No. 22,704, dated January 25, 1859.

To all whom it may concern:

Be it known that I, AUGUSTUS M. CHURCH, of the city of Augusta, in the county of Richmond and State of Georgia, have invented a new and useful Machine for Separating and Securing Fine Particles of Gold from its Ores; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1, is a plan, Fig. 2, an elevation and Figs. 3 and 4, explanatory sections.

A, in the figures designates the wooden framework and parts thereof, as in the sections; B, is a circular trough of cast iron fixed on the frame; C, is a revolving disk, also of cast iron, which is fastened by a set screw to the upright shaft D, upon which it may be raised for the purpose of examining the contents of the circular trough, said disk is perforated by eight or more holes over the middle of said circular trough, into which the pipes as designated by the letters *a* and *b*, are fastened, and said pipes have solid or pipe crosses at their lower extremities.

On the upper end of the shaft D, there is a bevel or a miter wheel E which is worked by a similar wheel F, on the horizontal shaft G.

H and I, are fast and loose pulleys, on the shaft G, and the pulley H is connected by a band, with the steam engine or other power used for driving the machine. K, is a fast pulley also on the shaft G, and it is connected by a band with the shaft L, which carries the crank pulley M and by a crank pin and connecting rod as designated by *c*, on said pulley, gives a reciprocating motion to the inclined trough N, which said trough is supported by and slides upon the rods marked *d*, the ends of which only are seen in the figures; but instead of these rods, in machines for heavy work, bars under the trough may be used.

The trough N is of sheet iron and it is furnished with "riffles" extending across it from side to side, but only every alternate riffle is in contact with and fastened to the bottom of said trough, the other riffles have an opening of about half an inch between their lower edges and the bottom of said trough, when in its proper place said trough

is so inclined that water will pass freely from its upper to its lower end.

The circular trough is to be fixed on the frame so that the notch *e*, on the inside will be exactly over the upper end of the inclined trough N, and, its bottom is to be covered with quicksilver, the disk C, is to be let down and fastened on its shaft, so that the crosses on the lower end of the tubes *a*, *b* and *c* may come nearly but not quite in contact with the quicksilver. The ore mixed with water is to be let on the disk C from a tank or hopper by means of a trough or spout leading from it to said disk. In the bottom of the circular trough there is a screw plug marked *s*, by means of which, the quicksilver may at any time be let out of said trough, but the position of said screw plug is of but little importance as it may be on the inside, on the outside or in any other convenient position to answer the purpose.

In specifying the material used in the construction of the parts of the machine it is not intended that such parts shall only be made of the material mentioned but that they may be made of it or of any other suitable material.

The operation of the machine is as follows: The ore and water falling upon the revolving disk will pass through the perforations in it into the tubes *a*, *b* and *c* and be distributed by them upon the surface of the quicksilver contained in the circular trough, and as they will be agitated and raked over said surface an opportunity will be afforded for the fine as well as the heavy particles of gold contained by the ore to come in contact with and be submerged in the quicksilver. The ore and water will of course be regularly let on and so soon as the circular trough is properly filled they will pass from the surface out of it, through the notch on the inside and fall into the inclined trough at its upper end, thence they will pass under the first "riffle," over the second, under the third, and so on, over and under said riffles alternately until they come to the lower end of the trough and are there finally discharged from the machine. If any particles of gold escape contact with the quicksilver in the circular trough and pass with the ore and water through the notch, they will be intercepted and retained by the riffles; to insure this the ore and water

are forced in contact with the bottom of the inclined trough by means of the raised riffles and as they will then have to rise over the top of the next riffle they will leave the heavy particles of sand, gold, etc., lodged against it, and this lodgment is greatly facilitated by the reciprocating movement of the inclined trough. If the circular trough should be worked too long and the quicksilver in it becomes "short" or saturated with gold, or "broken up" by any other means, so as to pass out at the notch with the ore and water, it will be retained by the riffles in the inclined trough, and by occasional examination of the contents of the spaces between the riffles it will be known that the contents of the circular trough should be removed or adjusted, or that a fresh supply of quicksilver is required. The disk is intended to make about eighteen or twenty revolutions, and the inclined trough

to make about two hundred vibrations per minute, but of course the speed of these will have to be regulated by the fineness or otherwise of the particles of gold to be separated from the ore. 25

I do not claim to have invented any of the separate parts of this machine as they have been long used for various purposes and are well known. 30

What I claim and desire to secure by Letters Patent is—

The arrangement herein described of the vibrating riffles of the inclined trough constructed and operated as set forth, by which it is proposed to save the finest particles of the gold by amalgamation. 35

AUGUSTUS M. CHURCH.

In presence of—

WILLIAM G. LOCKWOOD,
SILAS C. READ.