

W. M. COURTIS.
ORE-SEPARATOR.

No. 187,821.

Patented Feb. 27, 1877.

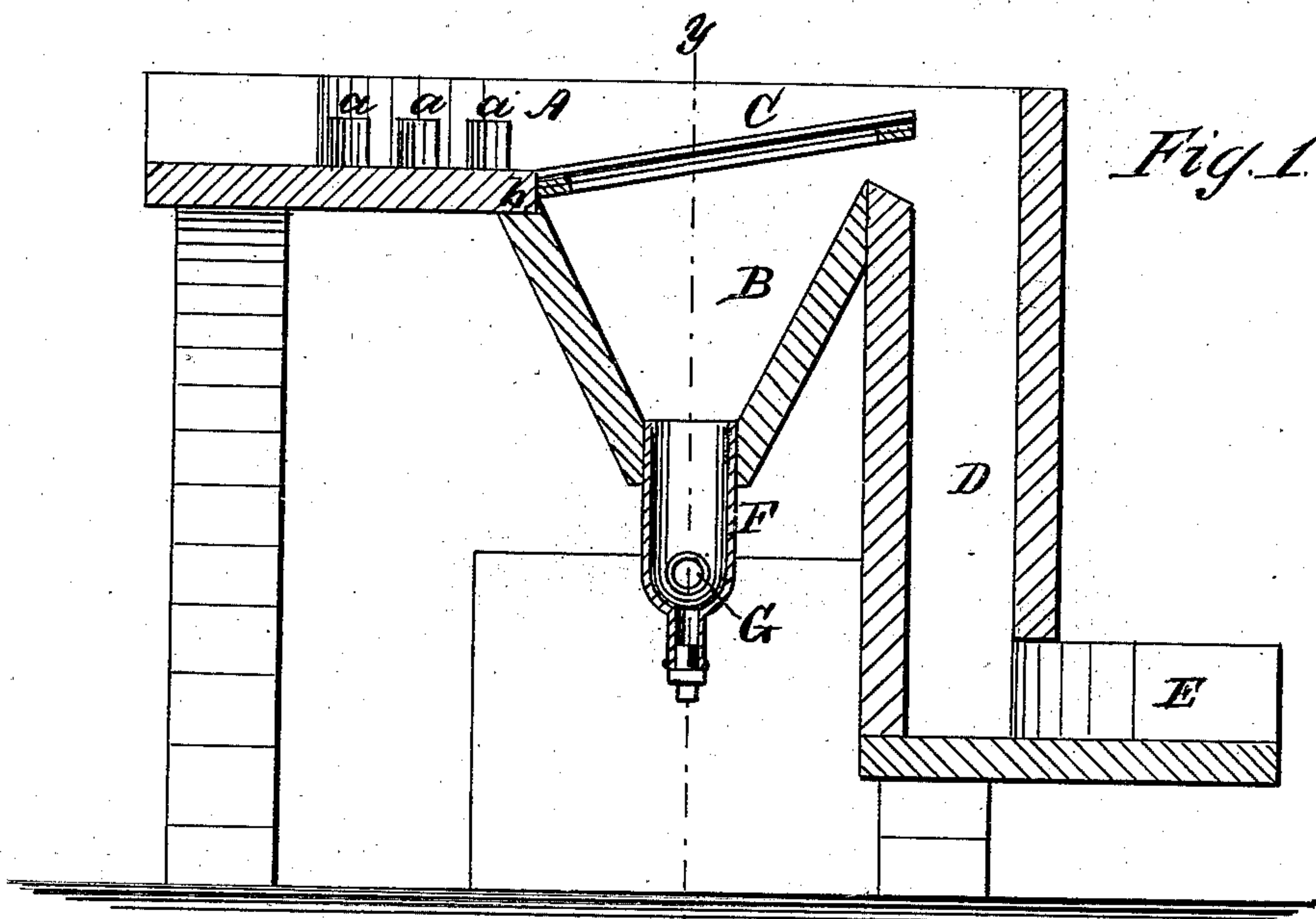


Fig. 1.

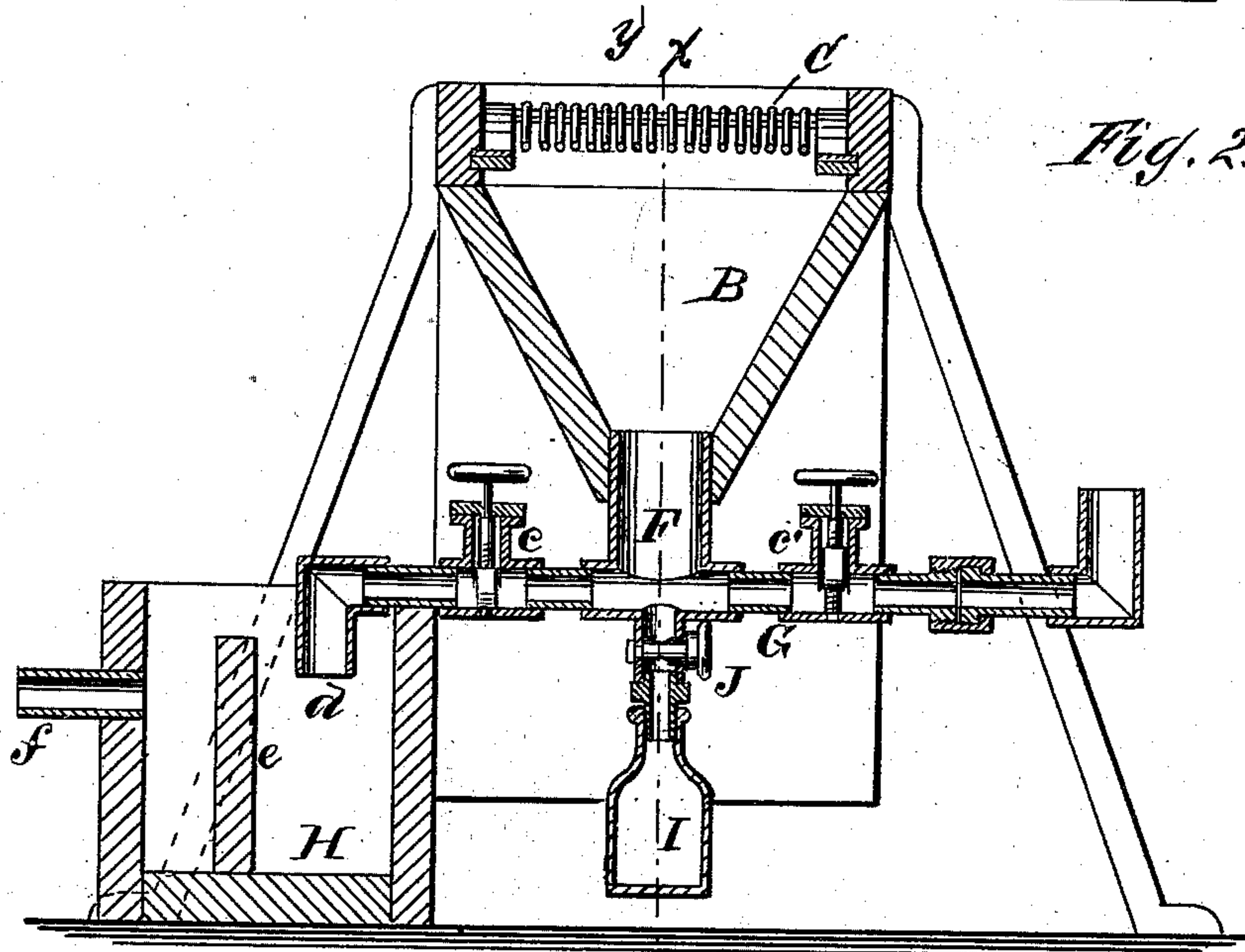


Fig. 2.

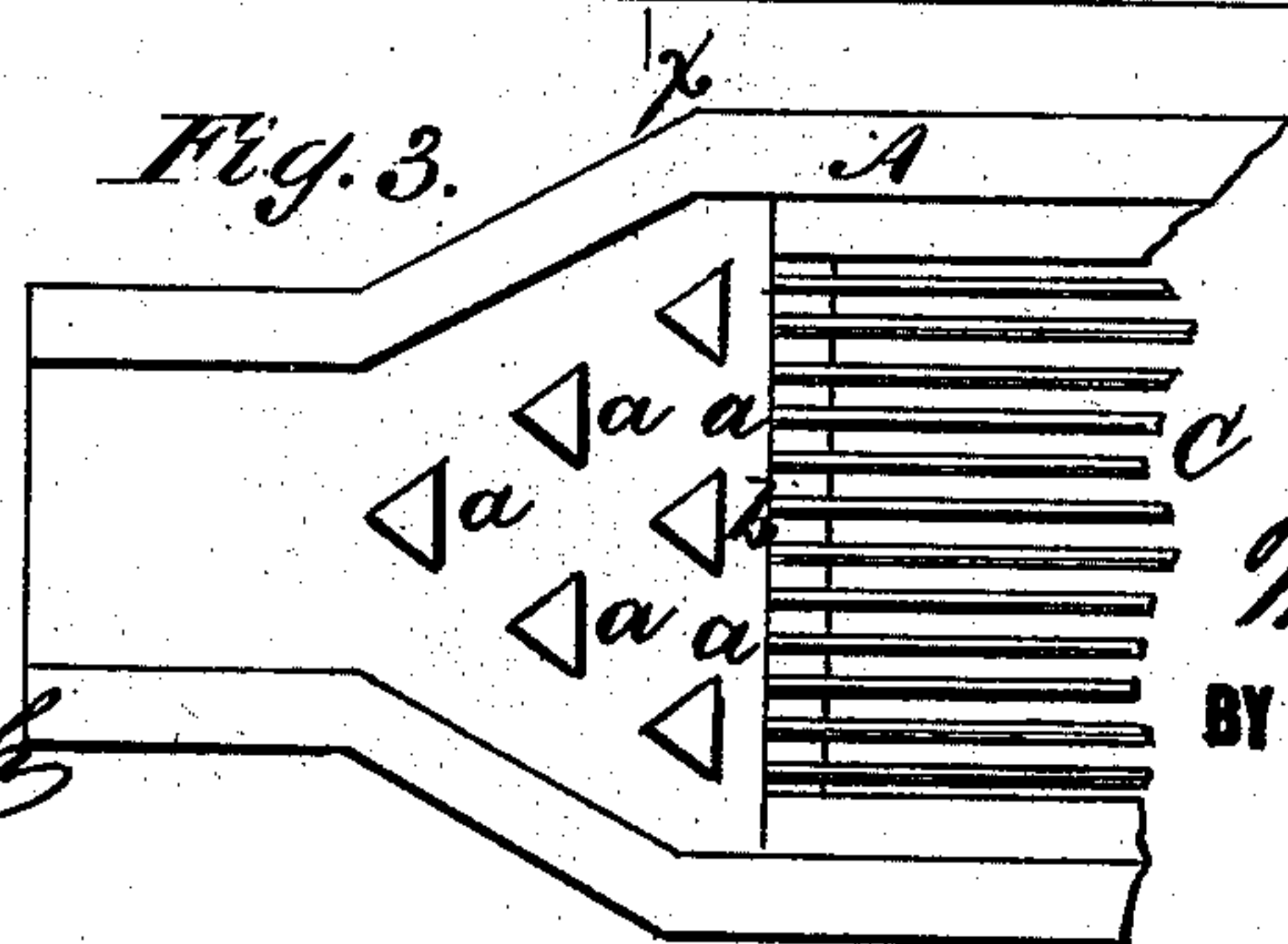


Fig. 3.

WITNESSES:

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WILLIAM M. COURTIS, OF WYANDOTTE, MICHIGAN.

IMPROVEMENT IN ORE-SEPARATORS.

Specification forming part of Letters Patent No. 187,821, dated February 27, 1877; application filed January 13, 1877.

To all whom it may concern:

Be it known that I, WILLIAM M. COURTIS, of Wyandotte, in the county of Wayne and State of Michigan, have invented a new and Improved Hydraulic Riffle, of which the following is a specification:

Figure 1 is a vertical section on line *x x* in Fig. 2. Fig. 2 is a vertical section on line *y y* in Fig. 1. Fig. 3 is a detail view of a portion of the top of the machine.

Similar letters of reference indicate corresponding parts.

The object of this invention is to separate the heavier from the lighter particles of tailings by the action of currents of water, thereby providing a riffle that is entirely automatic in its operation.

The invention will first be described in connection with the drawing, and then pointed out in the claims.

In the drawing, A is a chute, that is somewhat larger than the tail-race leading from the washer, and is provided with the triangular blocks *a*, projecting upward from its bottom, for breaking and diffusing the inflowing current of tailings. The bottom of this chute is discontinued at *b*, and a hopper, B, is placed under the opening so formed. Above the hopper B the inclined grating C is placed. This grating is composed of wires or rods, placed a small distance apart, and running longitudinally in the chute A. It is arranged to receive the larger particles carried in the tailings and deliver them to a vertical passage or chute, D, which leads to the spout E, that conveys the tailings from the riffle. F is a pipe projecting downward from the hopper B, and connecting with the horizontal pipe G. This pipe is provided with valves *c c'*, and with the downwardly-projecting elbow or nozzle *d*, which discharges into a settling-tank, H. I is a receptacle connected with the pipe G immediately under the pipe F, for receiving mercury and other heavy particles from the hopper B. J is a valve for closing the passage between the receptacle I and pipe G.

The settling-tank H is provided with a partition, *e*, that extends from its bottom nearly to its upper edge. It is also provided with an overflow-pipe, *f*.

The operation is as follows: The tailings

are received from the tail-race by the chute A, and are projected between the blocks *a* and upon the grating C with sufficient force to carry the larger particles over the end of the grating into the vertical chute D. The pipe G being connected with a supply-pipe containing water under pressure, and the valves *c c'* being opened, so that a portion of the water flowing through the pipe G passes upward into the hopper B, and another portion passes out through the nozzle *d*, an upward current is established in the hopper B, which joins the current of the tailings and flows with it into the passage D. The heavier of the particles that pass through the grating fall toward the pipe F, while the lighter of such particles are carried upward and discharged with the tailings.

The heavy particles—such as precious metals, amalgam, and mercury—descend through the pipe F into the pipe G. The mercury drops into the receptacle I, the valve J being open, and the metallic particles are carried forward and discharged into the settling-tank H, where they subside, while the water escapes through the overflow-pipe *f*.

The upward current in the pipe F and hopper B may be proportioned to the weight of the particles to be separated by adjusting the valves *c c'*.

The advantages secured by my invention are that the apparatus is automatic in its action, and separates the particles more perfectly than other apparatus now in use.

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

1. The combination of the chute A, hopper B, grating C, pipes F G, and valves *c c'*, substantially as herein shown and described.
2. The combination of the receptacle I, hopper B, and pipes F G, substantially as shown and described.
3. The settling-tank H, in combination with the hopper B and its pipes, substantially as and for the purpose herein shown and described.

WILLIAM MUNROE COURTIS.

Witnesses:

LIZZIE E. COURTIS,
MARY FOLGER.