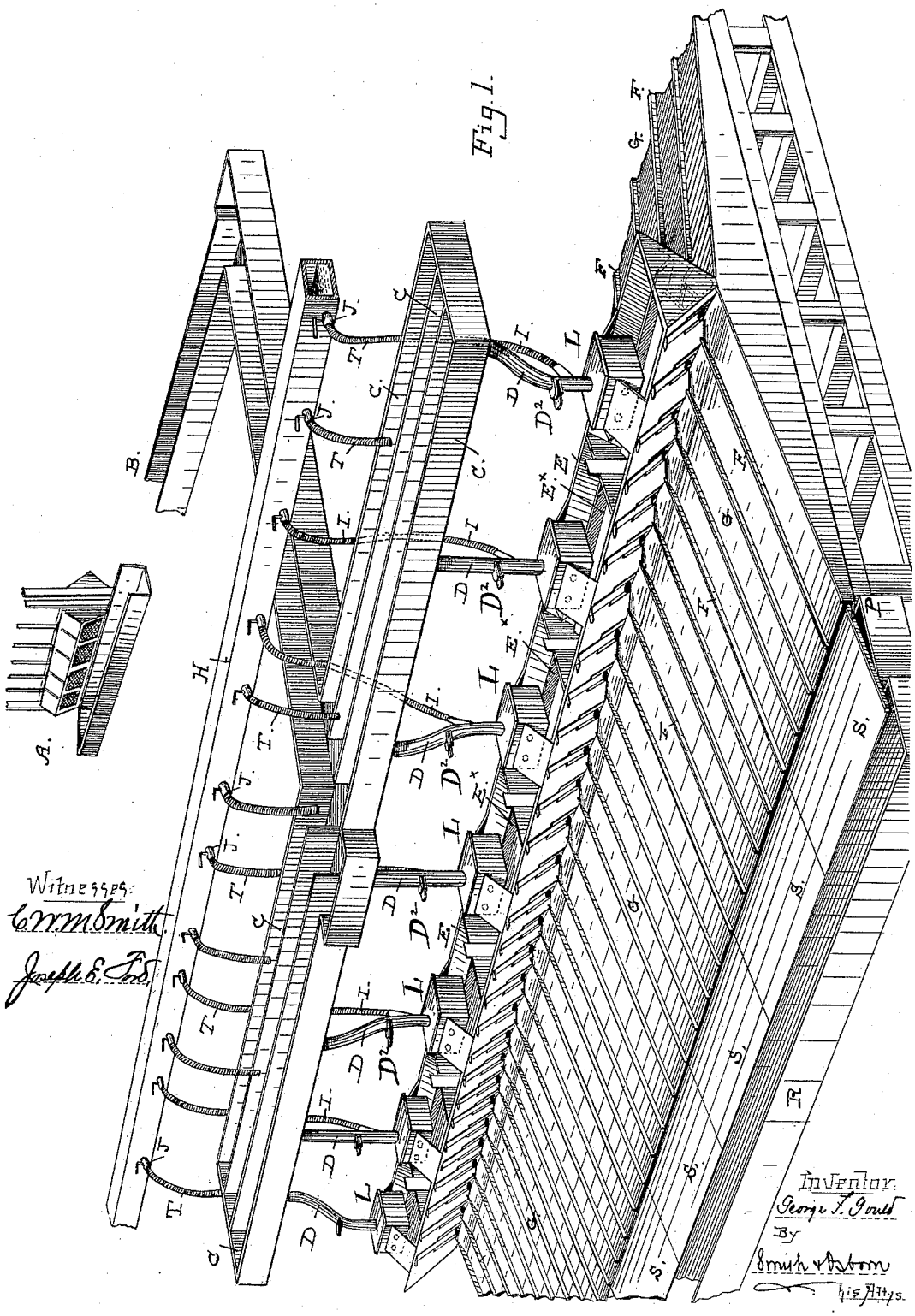
(No Model.) 3 Sheets—Sheet 1.

G. F. GOULD.

ORE CONCENTRATING APPARATUS.

No. 385,551. Patented July 3, 1888.

Fig. 1.



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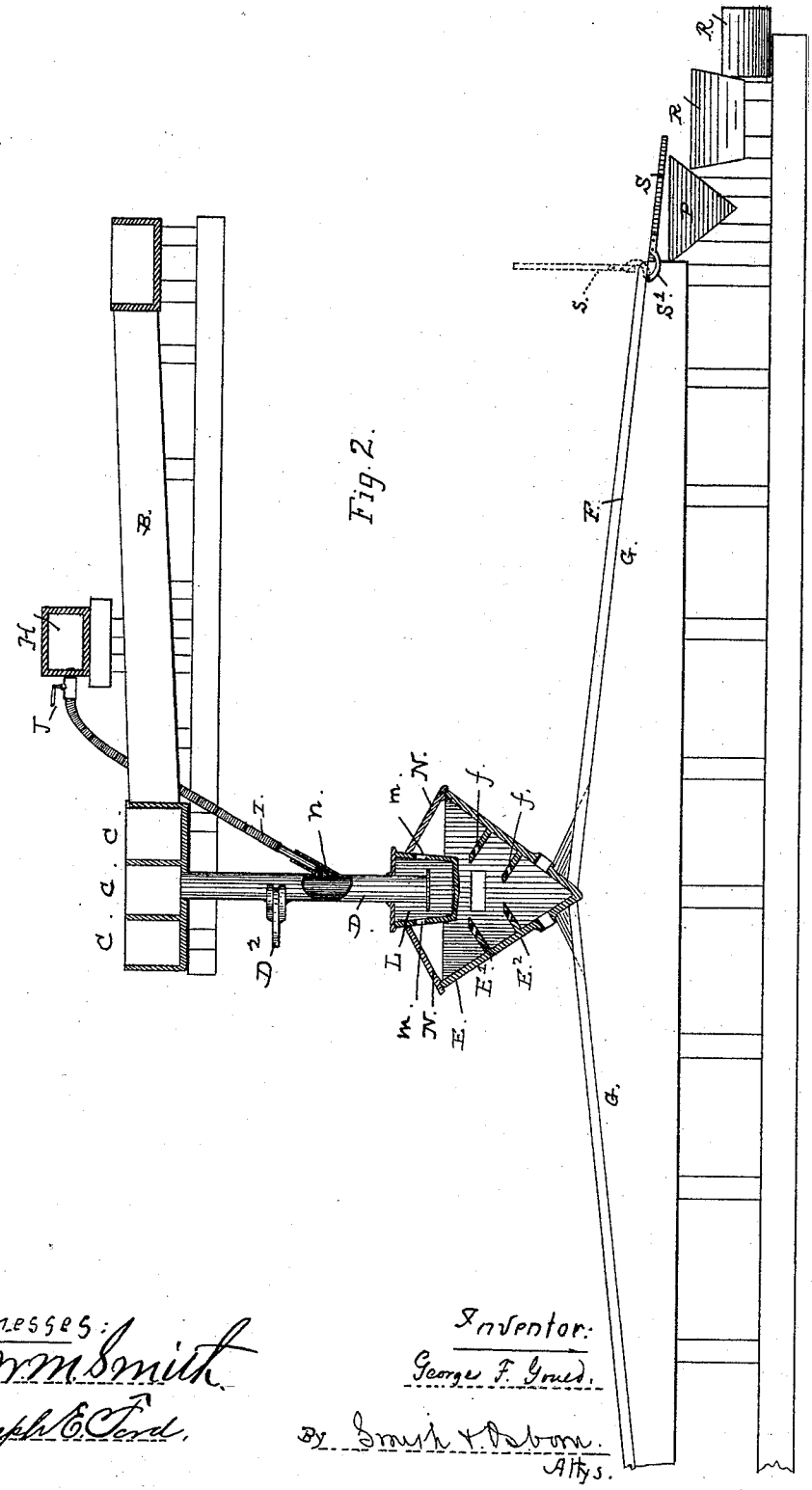

Fig. 2.

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Inventor:
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By Smith & Osborn.
Attys.

(No Model.) 3 Sheets—Sheet 3.

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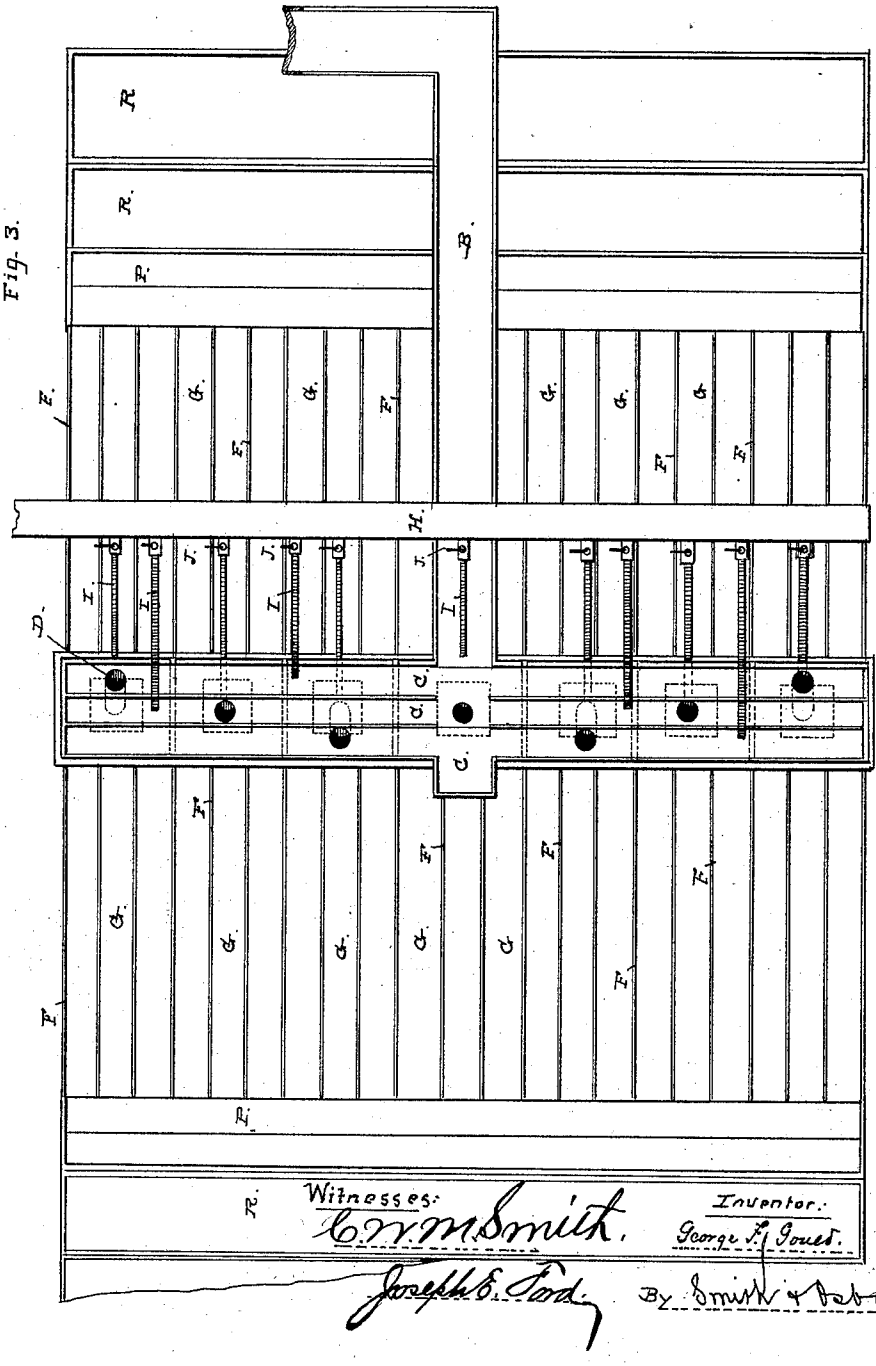
Fig. 3.



UNITED STATES PATENT OFFICE.

GEORGE F. GOULD, OF GRASS VALLEY, CALIFORNIA, ASSIGNOR OF TWO-THIRDS TO WILLIAM H. M. COBB AND DANIEL F. NORTON, BOTH OF DAYTON, NEVADA.

ORE-CONCENTRATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 385,551, dated July 3, 1888.

Application filed May 17, 1887. Serial No. 238,560. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. GOULD, a citizen of the United States, residing at Grass Valley, in the county of Nevada and State of California, have invented certain new and useful Improvements in Ore-Concentrating Apparatus; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the accompanying drawings.

My invention relates to improvements in the concentration of ores of the precious metals by wet processes, wherein the ore is reduced to pulp by crushing or grinding with water, and is then distributed over inclined surfaces for settlement of the metallic particles by gravitation.

The principle upon which my apparatus is constructed to work consists in progressive dilution of the ore pulp as it comes from the mill or battery and its distribution over and along stationary surfaces, the areas of which are increased with the dilution. The dilution is carried on by dividing and subdividing the pulp into separate portions and adding clear water to each portion. The conducting and concentrating surfaces by which this division is effected are stationary or without shaking motion, and are suitably inclined to cause the diluted pulp to flow at a rate of speed consistent with the gravitation of the metallic particles.

The object sought to be attained in and by my improvement is the separation from ore pulp of those particles of extreme grades of fineness which are found most difficult of concentration and are known to be lost in the tailings during the ordinary wet processes and operations.

To this end my improvement consists in the construction and combination of conductors and concentrating-surfaces, as hereinafter described, and pointed out in the claim.

The following description explains the manner in which I construct and operate my said apparatus, and the accompanying drawings therein referred to by figures and letters represent the apparatus as I have produced and arranged it for operation.

Figure 1 is a perspective view showing the relative positions and the manner of setting up the conductors and concentrating-surfaces constituting my improved apparatus. Fig. 2 is an elevation taken from the end, with parts in section. Fig. 3 is a plan view.

A represents a crushing or grinding mill of the usual kind, and B a sluice or open conductor having suitable capacity to take away the pulp and slightly inclined from the level of the discharge at the mill.

C C are separate conductors leading laterally in both directions away from the end of the first-mentioned conductor and having inclination from that end. The combined areas of the bottoms of these conductors afford an extent of surface considerably in excess of that provided in the first conductor, and the whole number divides the pulp into bodies or portions of about uniform bulk.

D are outlets and conducting-spouts leading from each space C, and terminating just over a distributing-trough, E, of which the outlet is placed at the higher end of an inclined table or surface, G, running the full length of the trough, and also arranged on both sides of it. Each of these surfaces G is divided by longitudinal partitions F F′ into spaces of about equal area, and the whole number gives a breadth of surface considerably in excess of the conductor that supplies it with material.

H is a water pipe or flume from the supply at hand, and I I are branch pipes leading from the pipe H to the several conducting-spaces B and C C, and provided with stop-cocks J J to control the supply.

In constructing the trough E provision is made for retaining whatever metallic particles will settle from the material running through. For this purpose the trough is made with sloping sides, and the space within is broken by shelves or inclined partitions E′ E², &c., placed one below the other and projecting toward the middle of the pulp-trough one beyond the other, as shown in Fig. 2. Each of these shelves discharges by outlets *f f* from one to the other in turn, and the lowest one into the bottom space of the main trough.

The conducting-spouts D do not discharge directly into these troughs, but each one dips into a close box, L, the top of which fits around

the pipe to confine and form what I term a "mixing-chamber"—that is, a closed space in which the material is stirred up and its particles thoroughly distributed by the force of the water introduced from above. Outlets for the diluted material from this chamber are provided at M M, and these discharge upon the topmost shelves, E' E', of the distributing-trough. The open space from the edge of the trough to the box is covered by an apron to deflect the streams of diluted pulp into the top spaces. Each spout has a gate, D^2, above the discharge, and also in the side, at some point below the gate, and an opening, *n*, for introducing the end of a water-conductor. Flexible tubes or hose I, with nozzles to set into the openings *n*, can be employed for this purpose to advantage, as they can be uncoupled from the spout D in the operation of cleaning up, and the streams of water supplied by them are then directed against the surfaces for washing off the concentrates.

P R are tanks set across the lower ends of the concentrating-surfaces G to receive the tailings at such time, and outside of these are settling-troughs R R. By means of aprons S S, set across the tanks P, the concentrates will be carried over the tailings-trough and discharged into the troughs R in the operation of cleaning up the concentrates. The aprons are attached to the ends of the inclined tables by hinges S' S', and when turned up, as indicated by dotted lines in Fig. 2, a clear space is left for the tailings to run off under its edge; or, if preferred, the aprons can be attached by open fastenings, that will permit them to be taken off.

The concentrating-surfaces incline in two directions from the distributing-troughs, and are faced with some coarsely-woven fabric—such as canvas—stretched and fastened in place by the longitudinal strips.

The excessive dilution of the material is calculated to bring the metallic particles into condition most favorable for separation and concentration, and particularly the finest particles, which exist in a greater or less proportion in all pulp and are the most difficult to save.

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

In combination with the inclined concentrating tables or surfaces G, the distributing-trough E, having the shelves or ledges E' E^2, arranged one above another with outlets, the conductor D and water-supply pipe I, and the sluices B C, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

GEORGE F. GOULD. [L. S.]

Witnesses:

CHAS. E. KELLY,

C. W. M. SMITH.