

(No Model.)

J. H. McCOY.
ORE CONCENTRATOR.

No. 501,022.

Patented July 4, 1893.

Fig. 1.

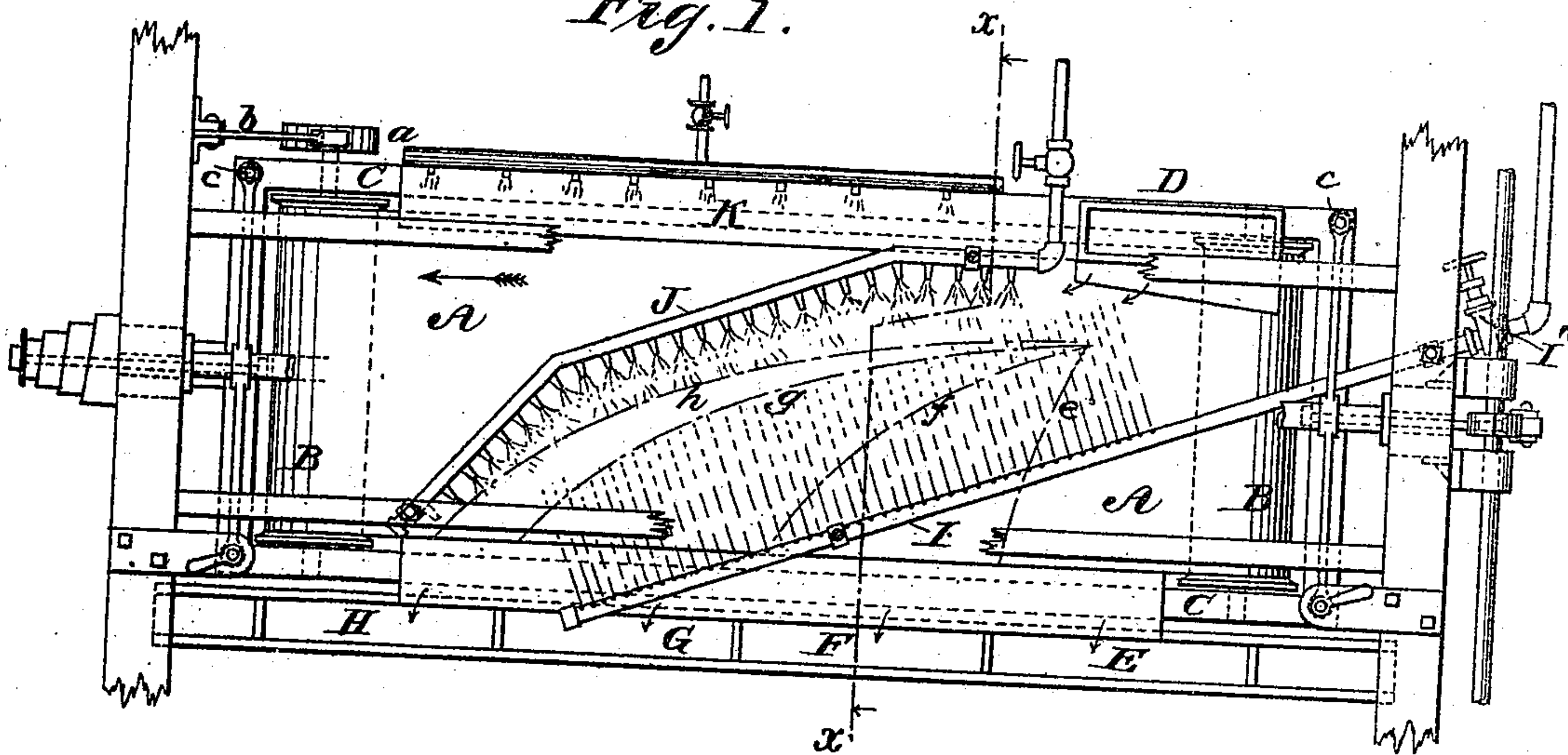
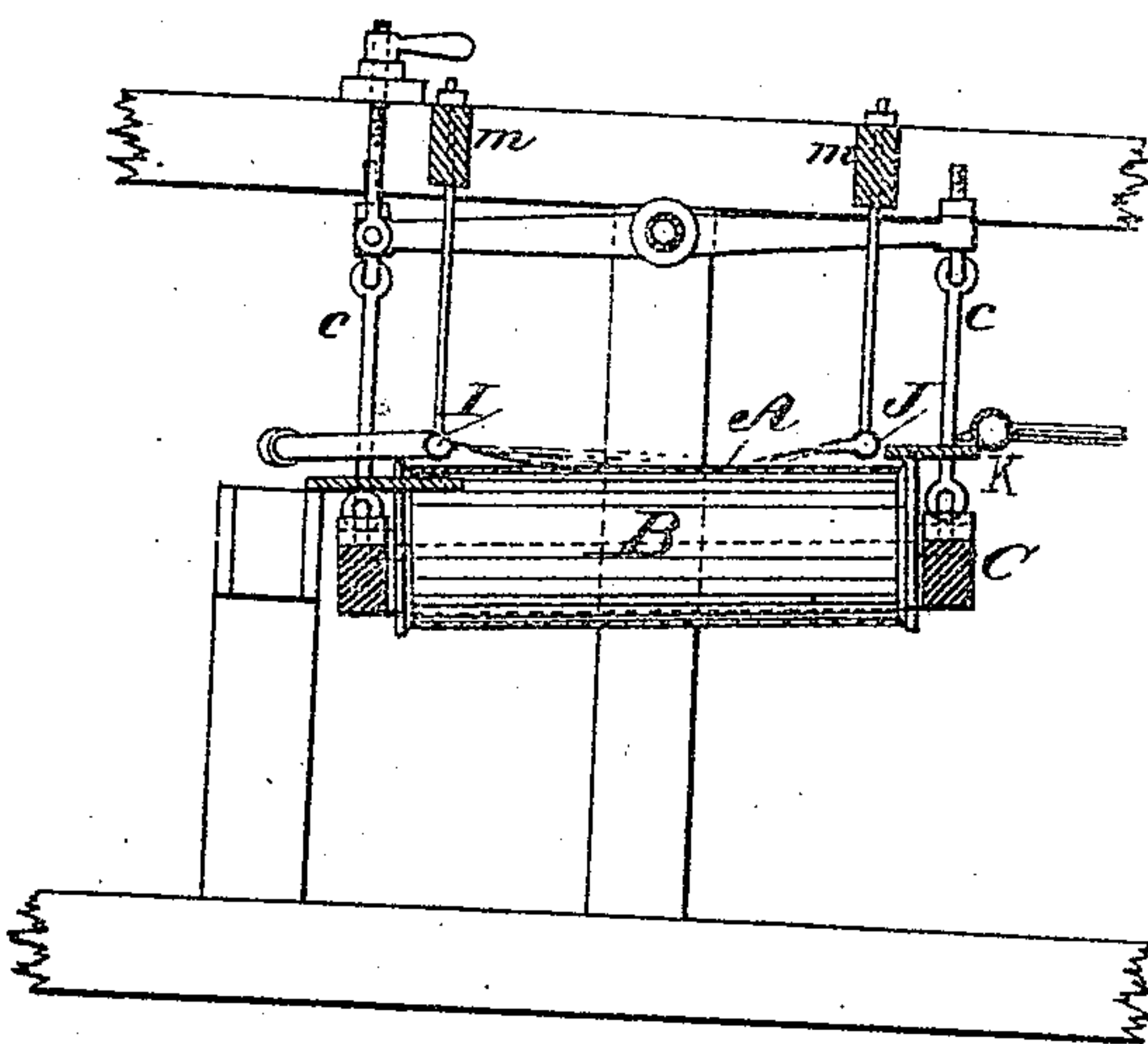


Fig. 2.



WITNESSES:

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JOHN HENRY MCCOY, OF OURAY, COLORADO, ASSIGNOR OF ONE-HALF TO
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ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 501,022, dated July 4, 1893.

Application filed September 17, 1892. Serial No. 446,232. (No model.)

To all whom it may concern:

Be it known that I, JOHN HENRY MCCOY, a citizen of the United States, residing at Ouray, in the county of Ouray, State of Colorado, have invented certain new and useful Improvements in Ore Concentrators and Separators, of which the following is a specification.

The object of my invention is to effectually separate from the headings all the inferior particles or heavier middlings; and said invention consists in the method of and suitable apparatus for the practice of the same hereinafter described and claimed, embodying the separation of such particles by means of a current of air, steam, or other gaseous fluid applied to the surface of the film of water containing the ore constituents.

Referring to the drawings: Figure 1, represents a plan view; and Fig. 2, a cross-sectional view on the line $x-x$, Fig. 1, showing one suitable construction of apparatus adapted for the practice of my invention.

A, represents a traveling belt or apron supported on rollers B, B, driven in rotation and carried in a frame C, provided with the usual spring, buffer, and helical cam for vibrating it; said frame being suspended by rods c , in the usual manner, as indicated. The belt A, is rotated by the ratchet a , and pawl b , actuated by the vibration of the frame C.

D, represents the hopper for supplying the ore pulp to the upper edge of the apron A, which is inclined laterally; and E, F, G, H, represent a series of receptacles for the classified constituents of the pulp discharged from the lower edge of the apron A. Water is supplied in suitable quantities from the feeder K, to the highest edge of the apron A. The dotted lines e, f, g, h , indicate the approximate zones which the constituents of various specific gravity follow during the operation of the machine; the gangue or tailings following the zone e ; the middlings following the zones f, g ; and the headings or valuable metalliferous particles following the zone h , into the receptacle H.

I represents a suitable perforated pipe which is supplied from a suitable source with air, steam, or other gaseous fluid under pressure; the degree of which may be regulated by valve I'. The pipe I, is suspended above the apron

A, in close proximity thereto, in a position substantially as indicated, and the perforations are arranged upon one side so as to deliver the air with force along the surface of the water film on the apron opposite to the flow thereof.

J, is a water jet pipe also supported above the apron A, adapted to direct the film toward the gaseous fluid jets from pipe I; the latter thereby counteracting the wash, producing riffles and dislodging all other particles than those of greatest specific gravity.

The pipes I, J, are suspended from a suitable superstructure m, m .

The operation is as follows: The ore pulp or mill tailings containing heavy and valuable metalliferous particles such as gold, silver, copper, tin, &c., is fed at D, upon the belt A, moving in the direction of the arrow indicated, and receiving the lateral wash from K, or J, or both, the constituents are concentrated into separate zones e, f, g, h . It has been found in practice that the heavier middlings or metalliferous particles of secondary specific gravity in complex ores, and which are intended to enter the receptacle G, are frequently carried along with the headings into the receptacle H, rendering the concentration imperfect. This is caused by reason of the heavier middlings settling in among the particles of gold or silver or other headings on the surface of the belt at the bottom of the film of water thereon, thereby escaping the wash as the film flows off into receptacle G. The air or equivalent current from I, operates to agitate or riffle the film of water, and to drive back, by means of the gaseous counter-current applied to the surface of the film, all such particles as are disturbed or raised by such agitation. The air current is adjusted in force by the valve I', or other suitable means, so that it will drive back all particles excepting the heaviest, and those that are driven back are ultimately delivered into the compartments designed to receive the middlings. The remaining particles which the air jet fails to dislodge pass into receptacle H, as clean headings.

My invention may be applied to any character of concentrating plane, whether a belt or table, and whether inclined laterally or lon-

gitudinally, and irrespective of the particular character of the motions, if any, imparted to the said plane.

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

1. The combination with an ore concentrat-
ing plane, of a water jet pipe and means for
delivering a counter-current of gaseous fluid
10 across the surface of the water in opposition
to the wash produced by said water pipe, for
the purposes described.

2. The combination with an ore concentrat-
ing plane, of a jet pipe for projecting a film
of liquid upon the surface of the plane and 15
another jet pipe for projecting a counter-cur-
rent of gaseous fluid upon the surface of the
said film in opposition to its direction of flow,
for the purposes described.

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Witnesses:

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