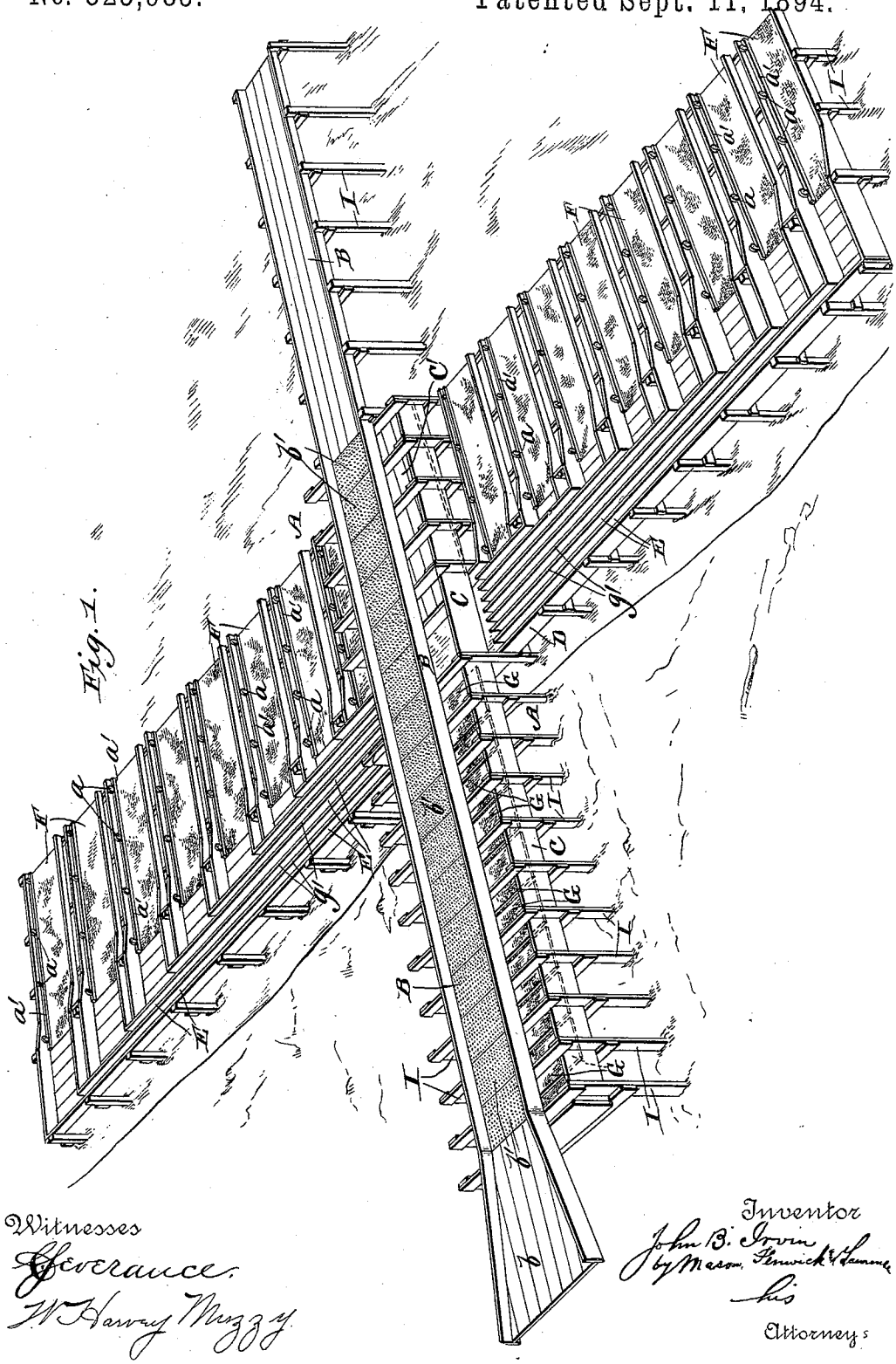
(No Model.) 2 Sheets—Sheet 1.

J. B. IRVIN.

APPARATUS FOR WASHING AND SEPARATING GOLD.

No. 525,983. Patented Sept. 11, 1894.



Witnesses
Geverance.
W Harvey Muzzy

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John B. Irvin
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his
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

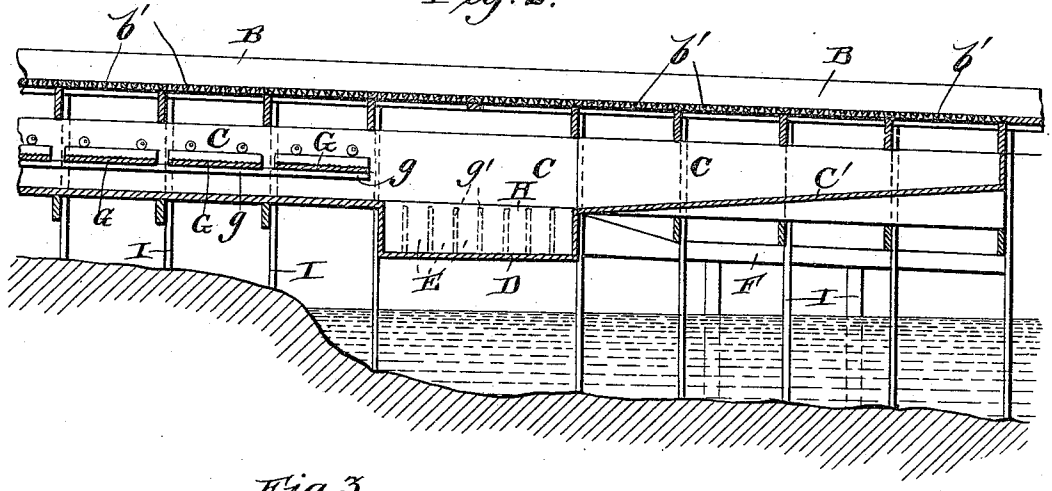


Fig. 3.

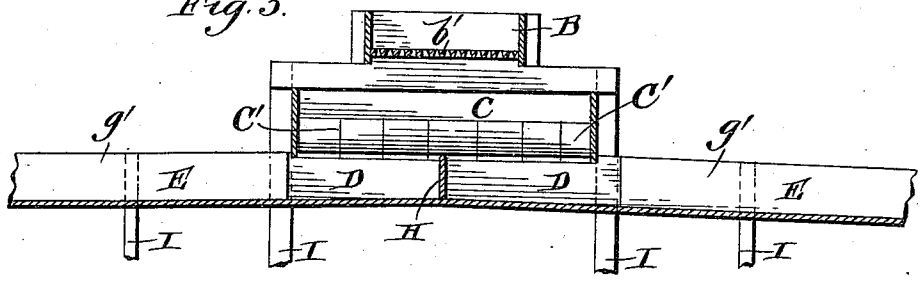


Fig. 4.

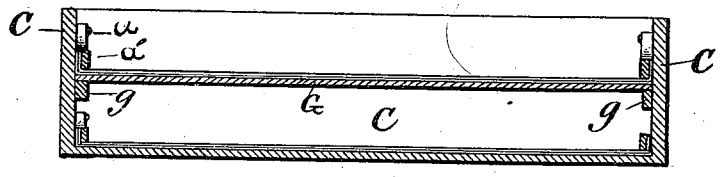
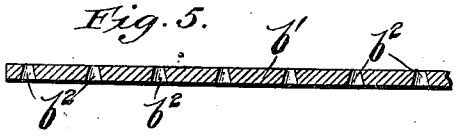


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN B. IRVIN, OF GRAND VIEW, IDAHO, ASSIGNOR OF ONE-HALF TO THOMAS A. MERRITT, OF DULUTH, MINNESOTA.

APPARATUS FOR WASHING AND SEPARATING GOLD.

SPECIFICATION forming part of Letters Patent No. 525,983, dated September 11, 1894.

Application filed May 15, 1894. Serial No. 511,328. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. IRVIN, a citizen of the United States, residing at Grand View, in the county of Owyhee and State of Idaho, have invented certain new and useful Improvements in Apparatus for Washing and Separating Gold; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in that class of gold washers and separators that operate to wash, separate and collect "flour" gold, and it consists of the combination of a conducting flume having a perforated bottom, a sand box located beneath said conducting flume and provided with "burlap" or other suitable lining, transversely arranged tables placed at right angles to the said box and adapted to receive the discharge therefrom, a number of parallel channels each of which conveys an equal portion of sand and water to said tables, the latter being lined with "burlap" cloth.

It also consists of the combination of an inclined conducting flume having a perforated bottom, a sand box beneath said flume and lined with "burlap" or other suitable cloth or material, removable tables in said sand box—also covered with "burlap" or other such material, conducting channels for receiving the discharge from the sand box, a portion of each of said channels being covered with "burlap" or other cloth, and each channel receiving an equal amount of the water and sand, &c., discharged from the sand box; and it further consists in certain other novel constructions and combinations as will be hereinafter described and specifically claimed.

In the accompanying drawings: Figure 1 represents a perspective view of the apparatus embodying my invention. Fig. 2. represents a detail, vertical, central, longitudinal section through a portion of said apparatus. Fig. 3. represents a detail transverse section through the conducting flume, and sand box on the line of the discharge of said sand box into the transverse flume or lead box. Fig. 4. represents a transverse vertical section through the sand box, showing the method of supporting the tables therein, and Fig. 5. represents a vertical section through one of the grizzly or perforated steel plates of the conducting flume.

A in the drawings represents my improved apparatus for washing, separating and collecting flour gold, and it consists, essentially, of a longitudinally arranged perforated conducting flume B, a sand box C arranged parallel to and beneath said conducting flume and lined with "burlap" cloth, a transversely arranged flume or lead box D having conducting channels E and tables F, the latter covered with "burlap."

The stream of water carrying the gold bearing gravel is directed by a bell mouth box or chute *b* into the conducting flume B, the bottom of which is made up of perforated steel sheets *b'*, commonly known as "grizzly plates." The perforations b^2 of these plates are preferably about one sixteenth of an inch in diameter and one half of an inch between centers, and are conical, the larger diameter being on the under side of the plate. The plates are placed end to end upon a grade of about six inches to twelve feet and are supported by light cross timbers placed directly beneath them and resting upon the sides of the sand box C.

The bottom of the sand box is lined with burlap or other suitable material and like all the burlap linings in this machine, this lining is easily detachable, as during the operation of the machine it frequently becomes necessary to take off the burlap for the purpose of removing the gold from beneath the burlap and from the burlap itself.

A series of tables G are supported in the sand box about one foot above its bottom by brackets *g* and reach entirely across the box. These tables are designed each to receive the sand and water which pass through the grizzly plates directly above it and are placed at about intervals of three inches between adjacent tables. Like the bottom of the sand box these tables are covered with detachable burlap or other suitable material. These tables are level transversely to the sand box but have a grade in the direction of its length approximately equal to that of the grizzly plates

and the sand box. There is no table beneath the first grizzly plate and the water falls from it directly on the burlap in the bottom of the sand box. The water from each of the other grizzly plates falls upon a table placed vertically beneath it, and then runs off the lower edge of the table to the bottom of the sand box.

A transverse flume or lead box D is placed beneath and at right angles to the sand box. This lead box receives from the sand box, the discharge of the first ten grizzly plates, that from the eleventh and twelfth plates falls directly into it, and the discharge of the last four plates also empties into the lead box by means of a reverse grade G′ in the bottom of the sand box beneath these plates. The lead box divides the contents of the sand box into two equal parts by a partition H, one flowing right and the other left from the sand box. Each of the two wings of the lead box is divided into parallel channels E by partitions g', g', and each of said channels empties upon one of a set of tables F placed upon each side of the sand box and parallel thereto. These tables are similar to those ordinarily used in the burlap process, being shallow flumes. They are lined with burlap and set upon a grade of about four inches in twelve feet. The burlap or other similar material is attached to these tables and to the tables in the sand box by means of cams or buttons a pivoted to the side walls of the flumes in proximity to said tables so that when the burlap is placed on the tables and strips a' placed upon the edges of the same, the said cams can be turned down so as to press the strips firmly down on the burlap and thus keep it in position.

The whole machine is supported on suitable legs or piles I and as shown in the drawings, the outer end of the conducting flume and the sand box and all of the transverse flume are placed on the banks of a running stream so that the discharge of the tailings will be directly into the stream.

In this process probably ninety per cent. of the gold will be saved in the sand box, the side tables being used as a test of the efficiency of the machine and as an indication of when a clean up is advisable.

It is one of the special advantages claimed by this process that the frequent "clean ups" necessary in the old method are not required. The churning motion of the numerous fine streams of water and sand falling upon the burlap covered surfaces keeps them always fresh and clean and works the concentrates through the first layer of the burlap which is used in two thicknesses. In the old process of simple side tables with a smooth current frequent "clean ups" were necessary to prevent the formation of a slime upon the surface of the burlap which destroys its usefulness as a concentrating surface. The constant scouring of the burlap in the sand box makes it possible to run the machine constantly with occasional inspection and renewal of the burlaps on the side tables. The tables beneath the grizzly plates are so designed that they may be taken out and replaced while the machine is in operation. The grizzly plates being made in sections, are connected end to end in such a way that they may be easily set upon one side of the sand box when a thorough "clean up" of the sand box is necessary.

What I claim as my invention is—

1. In a gold washer and separator, the combination of a conducting flume provided with a perforated bottom, a sand box located beneath said flume and running parallel therewith, said sand box being lined with burlap or other equivalent material and tables covered with burlap or other equivalent material and located in the sand box beneath the conducting flume whereby gravel, gold, water and sand are adapted to pass through the perforations in the flume into the sand box, the gold being caught in said box and on the tables and the rest of the material to pass out of the sand box, substantially as described.

2. In a gold washer and separator the combination with a conducting flume provided with a perforated bottom of a sand box below the same and provided with tables; said sand box and tables being covered with suitable fibrous material and a transversely arranged flume or lead box adapted to receive the discharge from the sand box and divided into numerous channels each receiving an equal quantity of said discharge and a portion of each channel being lined with fibrous material, substantially as described.

3. In a gold washer and separator the combination with a conducting flume having a perforated bottom, a sand box provided with removable burlap tables and placed below the same and a transverse flume or lead box provided with conducting channels and burlap covered tables and receiving the discharge from said sand box, substantially as described.

4. In a gold washer and separator the combination with an inclined conducting flume having a bottom composed of perforated removable plates, a sand box below the same and provided with suitable fibrous material, tables in said sand box covered with said material, a transverse flume or lead box adapted to receive the discharge from the sand box; said flume being divided into numerous independent channels and tables covered with said fibrous material and receiving respectively the discharge from said channels, substantially as described.

5. In a gold washer and separator the combination with a conducting flume having a perforated bottom, a sand box below the same and provided with suitable fibrous material tables in said sand box removably covered with said fibrous material, devices for removably securing said material on said tables, a transverse flume or lead box receiv-

ing the discharge from the sand box, said flume being divided into numerous independent channels, tables removably covered with said fibrous material and adapted to receive respectively the discharge from said channels and devices for removably securing said material to said tables, substantially as described.

6. In a gold washer and separator the combination of an inclined, perforated conducting flume, a sand box provided with burlap or other equivalent material located below the conducting flume and extending parallel therewith, burlap tables located in said sand box below the conducting flume, a transversely arranged flume or lead box extending from both sides of the sand box at right angles thereto, a vertical partition in said flume below the discharge end of the sand box for directing the discharge from the sand box to both portions of the transverse flume or lead box, burlap tables in said transverse flume or lead box and independent channels for conducting the discharge from the said box to the respective tables, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

JOHN B. IRVIN.

Witnesses:
S. G. RHOADES,
E. H. JONES.