J. A. MURPHY.

METAL PRECIPITATOR AND SEPARATOR.

APPLICATION FILED AUG. 15, 1919.

1,349,086.

Patented Aug. 10, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

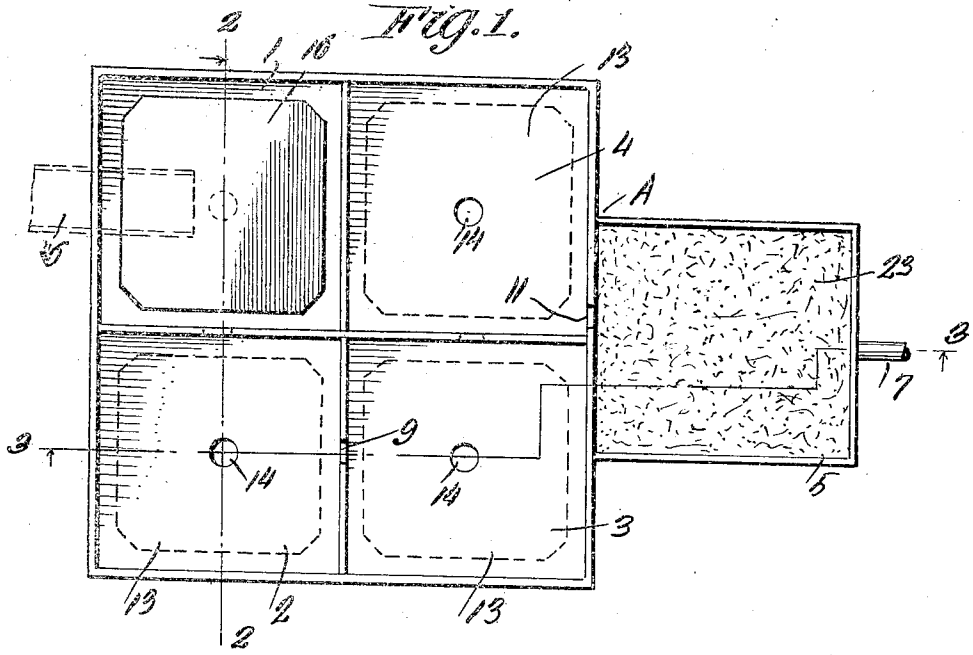
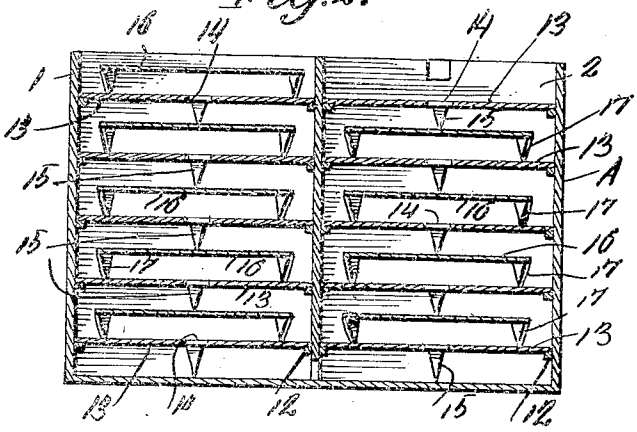


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

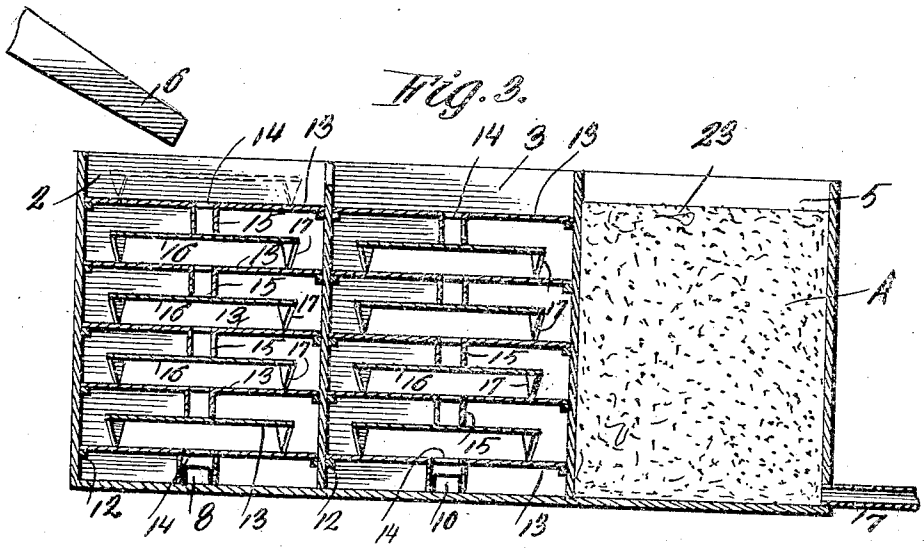


Fig. 4.

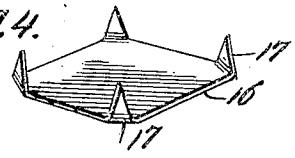


Fig. 6.

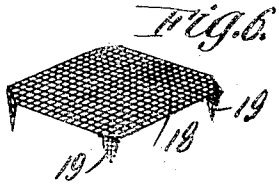


Fig. 5.

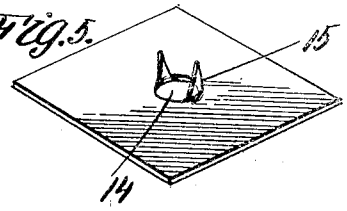
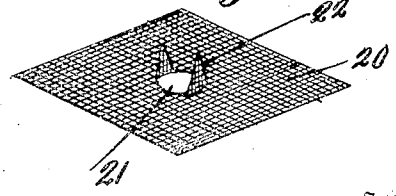


Fig. 7.



WITNESSES

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METAL PRECIPITATOR AND SEPARATOR.

1,349,086. Specification of Letters Patent. Patented Aug. 10, 1920.

Application filed August 15, 1919. Serial No. 317,762.

To all whom it may concern:

Be it known that I, JOHN A. MURPHY, a citizen of the United States, residing at Pueblo, in the county of Pueblo and State of Colorado, have invented certain new and useful Improvements in Metal Precipitators and Separators, of which the following is a specification.

My invention relates to new and useful improvements in metal precipitators and separators.

The principal object of the invention is the provision of a device of this character particularly adapted for separating metals such as gold, silver, copper, and lead, from waste water from mines, tunnels, etc.

Another object of the invention is the construction of the separator in such a manner that it will comprise a plurality of compartments for separating and receiving the different types of metals.

A further object of the invention resides in the provision of removable plates for receiving the separated metals so that the plates may be removed and the metal recovered.

With these and other objects in view my invention consists in the novel details of construction and arrangement of parts which will be more clearly understood from the following specification and drawings in which:—

Figure 1 is a top plan.

Fig. 2 a transverse vertical section on the line 2—2 of Fig. 1 looking in the direction of the arrow.

Fig. 3 is a longitudinal vertical section on the line 3—3 of Fig. 1 looking in the direction of the arrow.

Fig. 4 is a perspective showing the underside of one of the smaller separating plates.

Fig. 5 is a perspective showing the underside of one of the larger separator plates.

Fig. 6 is a perspective showing a top view of a modified form of small separator plates, and

Fig. 7 is a perspective showing a bottom view of a modified form of large separator plate.

In carrying out my invention I provide a receptacle or reservoir A which is divided into compartments 1, 2, 3, 4, and 5. A chute 6 leads from the mine, tunnel, etc. and conveys the drain water into the receptacle or reservoir A. As shown more particularly in Fig. 1 of the drawing the chute deposits the drain water in the receptacle 1 first. An outlet pipe 7 leads from the bottom of the compartment 5 as more particularly illustrated in Fig. 3 of the drawings.

An opening 8 is formed in the bottom of the partition between compartments 1 and 2, an opening 9 is formed in the top of the partition between the compartments 2 and 3, an opening 10 is formed in the bottom of the partition separating compartments 3 and 4, and an opening 11 is formed in the side of the reservoir to form communication from the compartment 4 to the compartment 5.

A plurality of vertically spaced cleats are secured in the compartments 1, 2, 3, and 4 and plates 13 are adapted to be received on these cleats. As shown in the drawings the plates 13 are preferably formed of a sheet of metal which is square in configuration to conform with the shape of the compartment. A central opening 14 is formed in each of the plates 13 and downwardly extending prongs 15 are struck from the plates. The purpose of these prongs will be presently described. A plurality of plates 16 are adapted to be received on the plates 13 and as shown more particularly in Fig. 4 of the drawings the plates 16 are of smaller size than the plates 13 and are provided on each corner with a prong or leg 17. By reference to Figs. 2 and 3 of the drawings it will be noted that the plates 16 are arranged intermediate the plates 13 and that the plates 13 are arranged adjacent the bottom and top of the compartments. As shown the prongs or legs 17 are adapted to rest upon the plates 13 and the prongs 15 of the plates 13 are adapted to engage the top of the plates 16. By this arrangement the plates 13 and 16 are spaced vertically so that water may flow therebetween in a manner to be later described.

In Figs. 6 and 7 I have shown slightly modified forms of the plates 13 and 16. In Fig. 6 I have shown a small plate 18 formed of wire mesh and provided with the prongs or legs 19 of the same material. In Fig. 7 I have shown one of the larger plates 20 which is of wire mesh and provided with a central opening 21 and prongs 22 struck therefrom. In using the plates 18 and 20 they will be arranged in the same manner as described for the plates 13 and 16.

The compartment 5 is adapted to be filled with mixed metal shavings and filings indicated at 23. The filings will extend up in this compartment to a point adjacent the lower end of the opening 11.

The plates 13 and 16 or 18 and 20 in the compartment 1 will preferably be of tin, silver, or like material to separate and collect gold. The plates 13 and 16 or 18 and 20, in the compartment 2 will be of phosphorus, bright steel, or like material, to separate and collect copper.

The plates 13 and 16, or 18 and 20, in the compartment 3, will be of copper, copper plated with mercury, or like material, to collect silver. The plates 13 and 16 or 18 and 20, in the compartment 4, will be of zinc, iron, or like material, to separate and collect lead.

As stated in the objects of the invention I provide a separator of simple and inexpensive construction particularly adapted for separating and collecting metal from drainage water from mines, etc. The water will pass down the chute 6 and be deposited into the compartment 1 of the reservoir A. The water will pass through the openings 14 in the plates 13 and around the plate 16. The gold contained in the drainage water will be deposited upon the plates 13 and 16 and the water will pass downwardly into the bottom of the compartment and pass through the opening 8 into the compartment 2. The water will pass upwardly through the openings in the plates 13 and around the plates 16 and copper in the water will be deposited upon the plates. The water will pass from the compartment 2 through the opening 9 into the compartment 3 and will take the same course as stated in the compartment 1. Silver in the water will be deposited upon the plates 13 and 16. The water from the compartment 3 passes through the opening 10 into the compartment 4 and rises the same as described for the flow in compartment 2. The plates 13 and 16 will collect lead from the water. From the compartment 4 the water passes through the opening 11 into the compartment 5 and passes down through the mixed metal shavings and filings 23 and is exhausted through the outlet pipe 7. The mixed metal shavings and filings 23, in the compartment 5, will collect the metal which has escaped the various plates in the several compartments.

While I have described the metal as being deposited upon the plates 13 and 16 it will be understood that if the wire mesh plates 18 and 20 are used the metal will be collected on these plates in the same manner.

The foregoing description and the drawings have reference to what may be considered the preferred, or approved form of my invention. It is to be understood that I make such changes in construction and arrangement and combination of parts, materials, dimensions, etc. as prove expedient and fall within the scope of the appended claims.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. A metal separator comprising a reservoir divided into a plurality of communicating compartments, vertically spaced cleats secured in each compartment, plates supported on the cleats and provided with central openings having depending prongs formed adjacent thereto, and small plates arranged intermediate the plates supported on the cleats, said smaller plates provided with legs adapted to engage the tops of the other plates and said depending prongs adapted to engage the surface of said smaller plates.

2. A metal separator comprising a reservoir divided into a plurality of communicating compartments, vertically spaced plates secured in said compartments and having centrally located openings, depending prongs formed on said plates adjacent said openings, smaller plates arranged between said first mentioned plates and provided with legs adapted to rest upon one of said first mentioned plates while the depending prongs of said first mentioned plates rest upon the surface of said smaller plates.

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

JOHN ANDREW MURPHY.

Witnesses:

P. C. GRIBBEN,

MAX BLACK.