(No Model.)

J. A. ARMBRUSTER.

GRADER AND AMALGAMATOR.

No. 517,721. Patented Apr. 3, 1894.

Fig 1

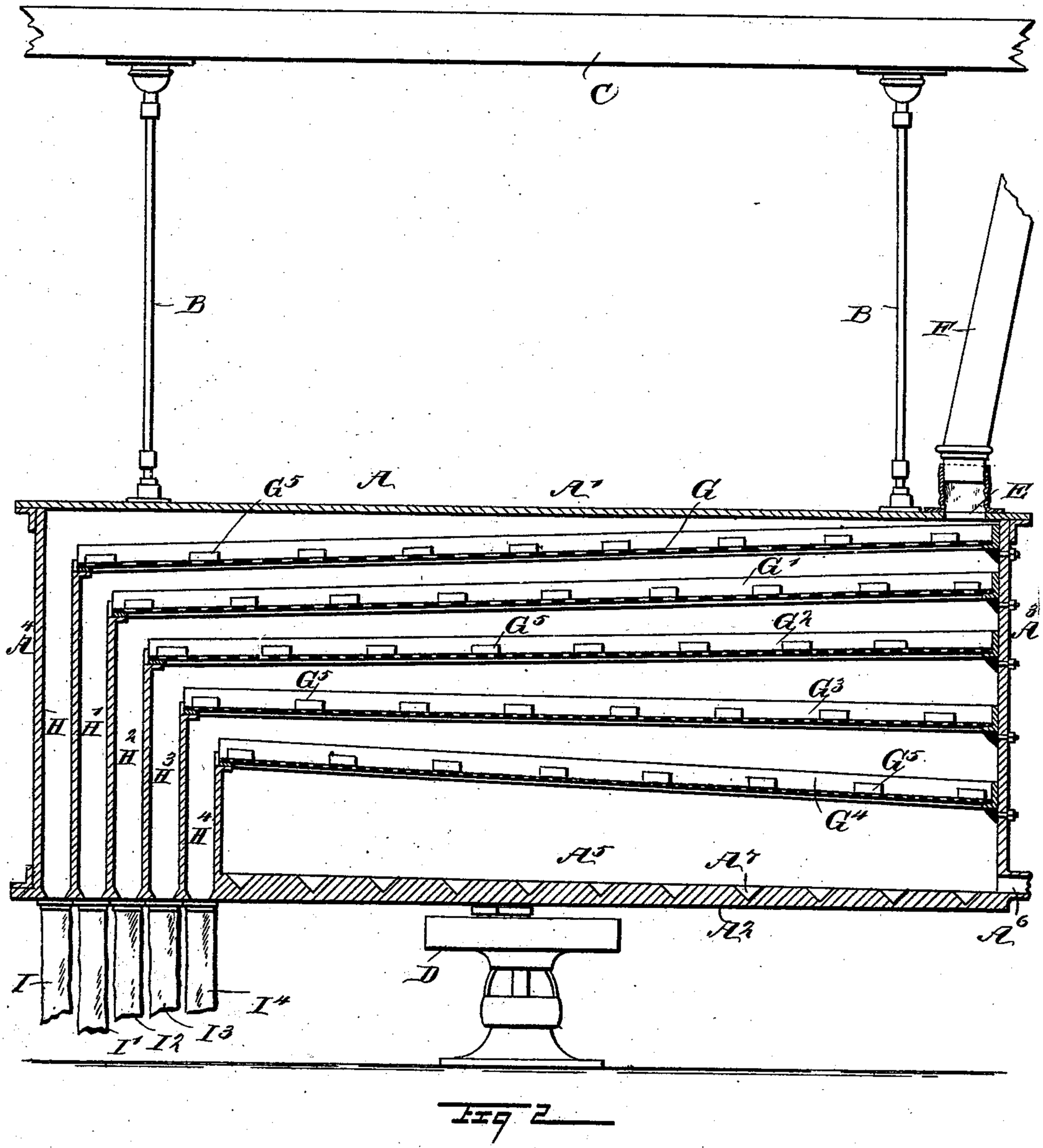
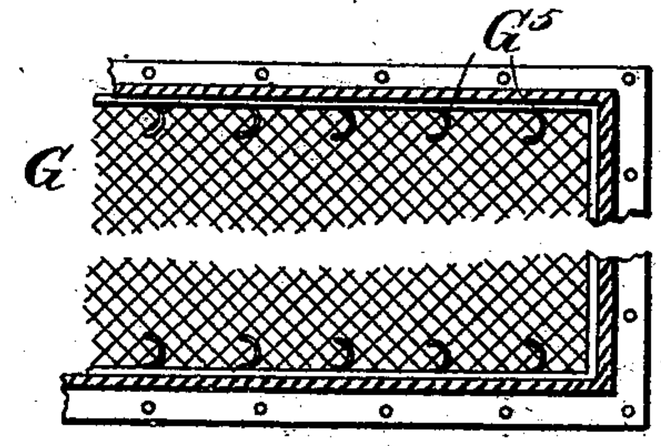


Fig 2



WITNESSES:

H. Walker

E. M. Clark

INVENTOR

John A. Armbruster

BY Munn & Co

ATTORNEYS.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN A. ARMBRUSTER, OF CHICAGO, ILLINOIS.

GRADER AND AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 517,721, dated April 3, 1894.

Application filed July 12, 1893. Serial No. 480,203. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. ARMBRUSTER, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Grader and Amalgamator, of which the following is a full, clear, and exact description.

The invention relates to machines for mechanically separating precious metals from the gangue, and the object is to provide a new and improved sieve grader and amalgamator which is simple and durable in construction, very effective in operation and arranged to effectively separate the gold from the tailings.

The invention consists of gyrating box connected with a stock supply and containing a series of graduated sieves arranged one above the other and with the upper sieves inclined downwardly from the inlet to their individual outlets and the lowermost sieves inclined upwardly to their outlets.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a sectional side elevation of the improvement; and Fig. 2 is a sectional plan view of one of the sieves.

The improved separator is provided with a suitably constructed box A connected at its top plate A′ with the suspending rods B having a ball and socket joint at their upper ends to connect with a ceiling C or other suitable support.

The bottom A^2 of the box A is connected with a suitable mechanism D for imparting a gyrating motion to the said box, the latter swinging on the supporting rods B.

On one end of the box A at the top plate A′ is arranged a flexible inlet E connected with a shoe F leading from the stamp mill or other device to supply the box A with the stock.

Within the box A are arranged longitudinally-extending and graduated sieves G, G′, G^2, G^3 and G^4, extending from the end A^3 of the box A to within a suitable distance of the other end A^4 to discharge at this end into individual outlets H, H′, H^2, H^3 and H^4, respectively, arranged vertically and connected at their lower ends with the flexible outlet chutes I, I′, I^2, I^3 and I^4 respectively, discharging the tailings on the ground or floor on which the machine is located.

As illustrated in Fig. 1, the sieves G, G′ and G^2 are inclined downwardly from the head A^3 to their individual outlets H, H′ and H^2 respectively, the upper sieve G being inclined to a higher degree than the next following one, as will be readily understood by reference to the said Fig. 1. The lowermost screens G^3 and G^4 are inclined upwardly from the end A^3 to their respective outlets H^3 and H^4. The lowermost screen G^4 is a suitable distance above the bottom A^2 so as to form within the casing a receiving chamber A^5 provided with a water outlet A^6 for carrying off surplus water.

The top surface of the bottom A^2 is formed with recesses or grooves containing mercury so as to readily take up the gold passing down into the said chamber A^5.

On the sides of each of the screens G, G′, G^2, G^3 and G^4, are arranged hook-like projections G^5, which serve to throw the material traveling up the sides toward the middle of the screen so as to keep the material agitated continually as long as the machine is in motion.

The operation is as follows: The box A receives the usual gyrating motion and when the stock is discharged into the box at the inlet E, then the stock first encounters the upper end of the top, the sieve G which has the greatest mesh, and discharges onto the second sieve G′ of a somewhat finer mesh, it being understood that the large tailings passing onto the sieve G roll down the same into the outlet H to be discharged to the outside by the chute I. The second great tailings are discharged by the sieve G′ at its lower end into the outlet H′ while the material which passes through the meshes of the sieve G′ falls onto the third sieve G^2 having a finer mesh than the sieve G′. The material passing through this sieve G^2 falls onto the next sieve G^3 which is inclined in an opposite direction to the sieves G^2, G′ and G, so that the material remains a longer time on the sieve to completely separate the tailings from the valuable stock, the tailings passing up the sieve to be finally discharged at its upper end into the outlet H^3. The material will first accumulate at the lower

end of the sieve, and as a grating effect is produced on the material by the gyratory motion of the machine, the heavier particles will work to the bottom, and the lighter ones to the top. As the lighter material gradually accumulates at the top and cannot travel in any other direction than toward the outlet located at the upper end of the sieve, said lighter particles will move upward to the said outlet H^3, being backed up partly by the head A^3 which forms an abutment for the said particles, and partly by the projections G^5. The finer stock next passes onto the lowermost sieve G^4 on which it is likewise treated, the tailings being discharged at the upper end of the sieve into the outlet H^4. The valuable stock passes through the fine meshes of the sieve G^4 into the chamber A^5 in which the gold is readily taken up by the mercury contained in the pockets formed by the recesses and grooves A^7, and the amalgamated material is, from time to time, removed for further treatment. It is understood that the stock passes into the box A with a considerable quantity of water part of which passes with the tailings through the outlets H, H′, H^2, H^3 and H^4 to the outside and part passes through the outlet A^6 leading from the chamber A^5.

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

1. A grader or like machine, comprising a box, provided with a suitable inlet, means for imparting a gyratory motion to the said box, and a series of superposed graduated sieves located in the box, the upper sieves being inclined downwardly toward their delivery ends so that the coarser particles will be accelerated in their motion toward the delivery ends of the said sieves, the lower sieves being fed by the upper ones, and inclined upwardly toward their delivery ends, to retard the finer particles and thus maintain a supply to the lower sieves equal to their full capacity, substantially as described.

2. A grader and amalgamator comprising a gyrating box connected at its top near one end with a stock supply, a series of graduated sieves arranged one above the other within the said box, the uppermost sieves being inclined in an opposite direction to the lowermost sieves, outlets arranged within the said box at the discharge ends of the said sieves, and a receiving chamber formed within the box below the lowermost sieve and provided in its bottom with pockets adapted to receive mercury, substantially as shown and described.

3. A grader and amalgamator comprising a gyrating box connected at its top near one end with a stock supply, a series of graduated sieves arranged one above the other within the said box, the uppermost sieves being inclined in an opposite direction to the lowermost sieves, outlets arranged within the said box at the discharge ends of the said sieves, a receiving chamber formed within the box below the lowermost sieve and provided in its bottom with pockets adapted to receive mercury, and a water outlet leading from the said chamber, substantially as shown and described.

JOHN A. ARMBRUSTER.

Witnesses:
CHARLES A. ARMBRUSTER,
AUGUST J. BAUMANN.