(No Model.)

J. P. SCHMITZ.

AMALGAMATOR.

No. 591,119. Patented Oct. 5, 1897.

FIG_1.

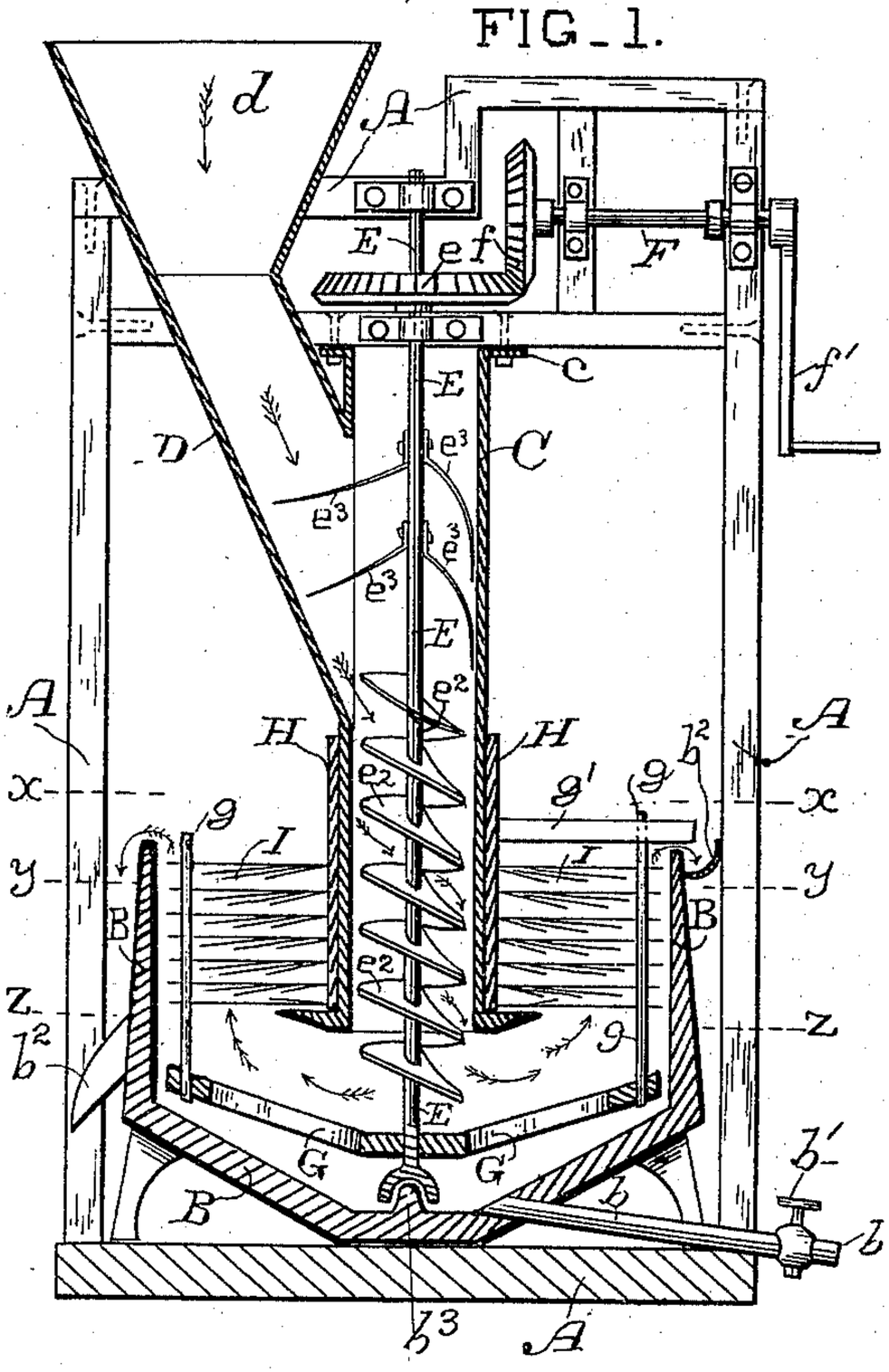


FIG_2.

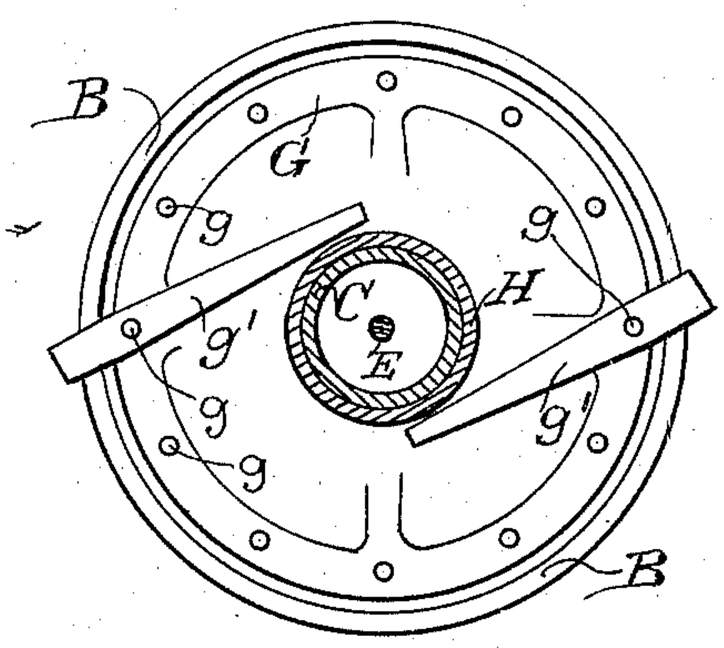


FIG_3.

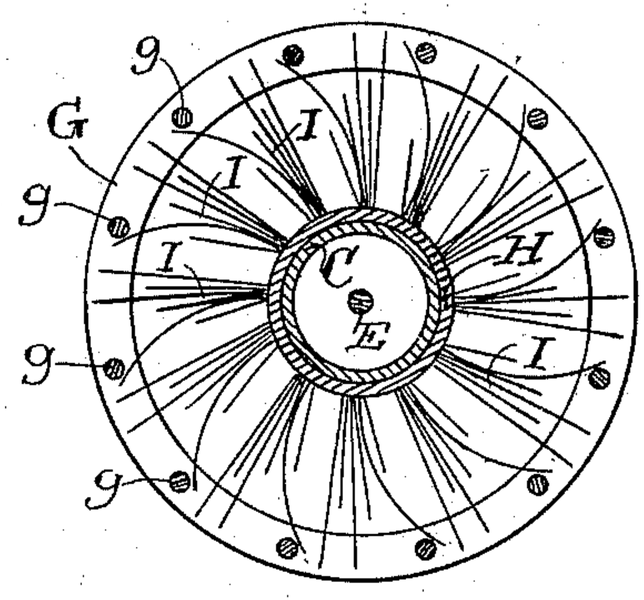


FIG_4.

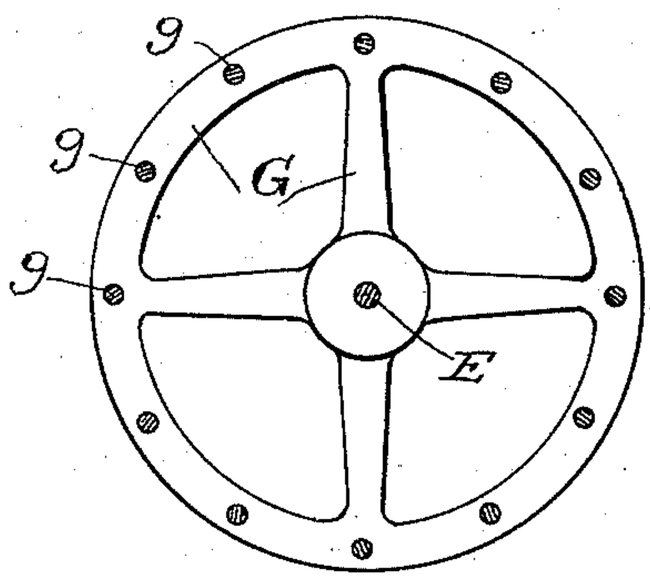
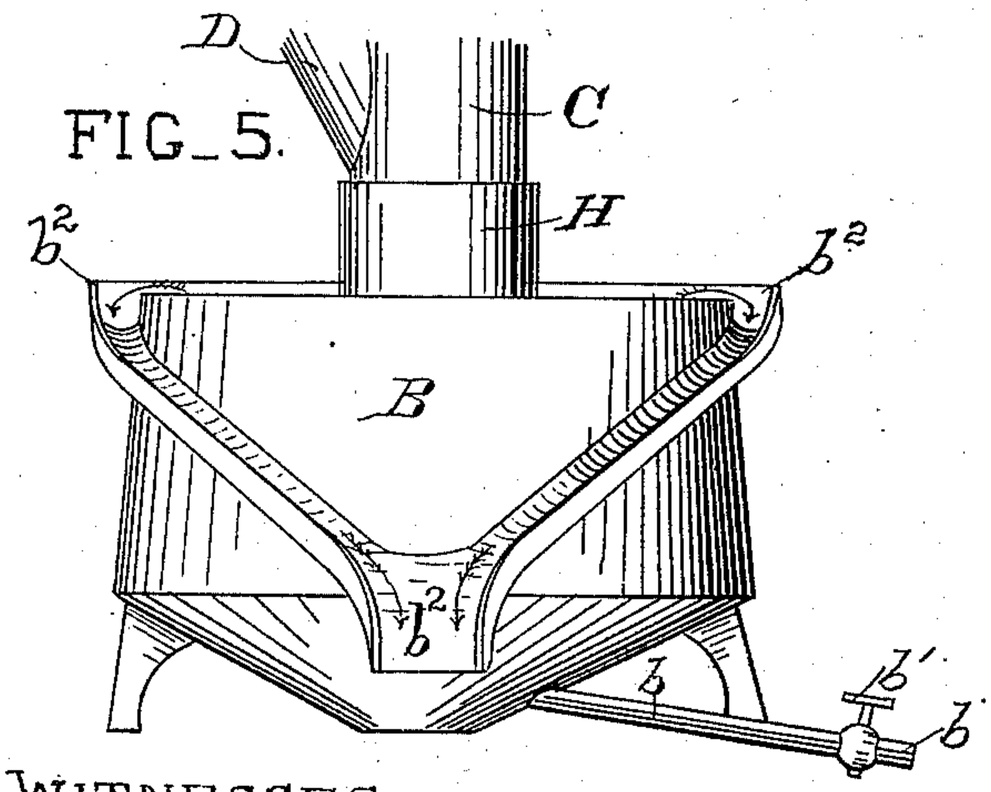


FIG_5.



WITNESSES:

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AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 591,119, dated October 5, 1897.

Application filed October 8, 1896. Serial No. 608,286. (No model.)

To all whom it may concern:

Be it known that I, JOHN PETER SCHMITZ, a citizen of the United States, residing at 3321 Twenty-First street, in the city and county of San Francisco and State of California, have invented a new and useful Amalgamator, of which the following is a specification.

My invention relates to improvements in amalgamators in which a brush is attached to a feeding-pipe and operated by a rotating shaft and a rotating feeding-screw; and the objects of my improvement are, first, to provide a continuous feeding of crushed quartz or sand through mercury or molten lead in the apparatus, thereby effecting the amalgamation of precious metals and mercury or lead, as the case may be; second, to afford the proper division and mixing of the crushed quartz or sand with the mercury or molten lead by the action of a brush and rotating shaft with screw, and, third, to remove the quartz or sand after having passed through the mercury or molten lead. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of my apparatus; Fig. 2, a horizontal view, part plan and part section, taken on the line X X of Fig. 1; Fig. 3, a horizontal section on line Y Y of Fig. 1; Fig. 4, a horizontal section on the line Z Z of Fig. 1. Fig. 5 is an elevation of the tub or pot of the apparatus.

Similar letters refer to similar parts throughout the several views.

The table or plate A represents the base of the supporting-frame; B, the pot, standing and resting with its lower central part and with its supporting-legs on the bottom plate of the frame; b, a drain-pipe, with faucet b', in communication with the lower part of the pot; b^2, a gutter sloping downward around the pot.

C is a vertical feeding-pipe provided at its lower end with an outwardly-tapering projection or ring, and at its upper end the pipe C is provided with a flange c for fastening the pipe to the cross-beam of the frame. The feeding-pipe C is also provided with a branch feeding-pipe D, which is in communication with hopper d.

E is a vertical shaft with socketed end fitting and resting on step b^3, on which it rotates. The shaft E is provided with spring-agitators e^3 and with a screw e^2. To the lower part of shaft E is fastened the spider-frame G, and to the upper part of the shaft is fastened the pinion e. The pinion e meshes with a gear f on shaft F, turned by a crank-handle f'.

e^2 is a screw, and e^3 are spring-agitators. Both are fastened to the shaft E.

G is a spider-frame attached to the lower portion of the shaft E. The spider-frame G is provided with rods or pins g near the periphery.

g' are two pushing-arms fastened to pins g.

H is a tube or sleeve forming the body of a brush fastened around the lower part of pipe C.

I are steel bristles inserted into the body H of the brush. The body H and bristles I form the brush. The bristles are inserted in the lower two-thirds of the body H, and at the projecting upper part of the body H the pushers g' slide around when in motion. The bristles of the brush can be made of any suitable material, though I prefer steel.

The vertical shaft E, previously referred to, rests on and rotates on step b^3, and at its upper part it passes through a hole in the cross-beam or through brackets fastened to the frame, whereby the shaft is held in position, but permitted to revolve. To the shaft E are fastened the pinion e, the spring-agitators e^3, the screw e^2, and the spider-frame G, carrying the pins g, all of which revolve when the gear f and shaft F are set in motion by the crank f'.

The pipe C is held in position by flange c, fastened to the frame. This pipe C has a rim on its lower end, projecting outwardly, thereby directing the ore to the middle and farther ends of the bristles I of the brush H I.

The pipe D directs the ore or sand placed in hopper d into the pipe C. The spring-agitators e^3 when in motion assists the direction and prevent clogging up of the ore in the pipe.

The screw e^2 is fitted nicely into pipe C, allowing its rotation within and partly below the end of the pipe, so that the greater part of the screw revolves within the mercury or lead

in pipe C and pot B, whereby the screw not only propels, but mixes the ore and mercury or lead in the pot and pipe.

The brush H I is fastened to the pipe C. The body H of the brush therefore cannot move, but some of the bristles I are agitated and move by the action of the rotating pins *g*. Some of the bristles in each pack or hole of the brush are short and some are long. The short ones assist in dividing the ore when it passes through the brush. The long bristles are agitated by the rotating pins *g*, thereby causing much division of the ore when passing through the brush and mercury or lead. Again, a further reason for making some of the bristles short, but others long, is that the brush has about one hundred and fifty holes, into which the bristles are inserted, and if the bristles, from six to ten in each hole of the brush, were all made so long as to be all agitated by the rotating pins *g* then no one man would be able to turn the crank *f'*. For that reason some bristles are made shorter than the others and less power is required to turn the crank.

The pins *g* are inserted near the periphery of the spider-frame G, which is fastened to the shaft E, and when the shaft E, screw e^2, and spider-frame G rotate the pins *g* are carried along and rotate also, thereby causing vibration of the bristles of the brush and agitating the ore with the mercury or lead in the pot. Of the two pushing-arms *g'* each is fastened to a pin *g* just above the bristles of the brush and rotates with the pins, but the inner ends of the two arms in their movement slide loosely around the body H of the brush, so that the powdered ore or sand when floating on the mercury or lead is pushed off and falls into the gutter b^2. The ore then rolls down to one side on the outside of the pot, as indicated in Fig. 5.

The operation is as follows: The pot B is filled with mercury, or with lead kept melted, to just above the bristles I. The mercury or lead then stands in pipe C on a level with that in the pot. Now sand or powdered ore is shoveled into hopper *d*, from where it passes through pipe D into pipe C. At the same time the crank *f'* is turned, which causes the shaft F, gear *f*, pinion *e*, shaft E, spring-agitators e^3, screw e^2, spider-frame G, and pins *g* to revolve. The screw e^2 carries down and mixes the ore or sand with the mercury or lead in pipe C and in the pot B. The ore being lighter than the mercury or lead it is directed by the projecting rim on the lower end of pipe C outward and upward. Then the ore and mercury are still further agitated and mixed by the action of the rotating pins *g*, causing the bristles of the brush to vibrate, and the ore finds its way to the surface of the mercury, where the pushers *g'* push the ore off the pot, as already stated. The ore drops into the sloping gutter b^2 and is carried off, as above explained.

I am aware that prior to my invention amalgamators have been made with screws propelling the ore toward the apparatus. I therefore do not claim such broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in an amalgamating apparatus, of the shaft E, spring-agitators e^3, screw e^2, spider-frame G, pins *g*, brush H I, pipe C, and pipe D, all substantially as shown and described.

2. In an amalgamating apparatus, the screw e^2, rotating partly within and partly below the lower end of pipe C, and projecting deep into the mercury or lead within pot B, in combination with shaft E, spring-agitators e^3, spider-frame G, pins *g*, brush H I, pipe C, and pipe D, substantially as shown and for the purpose specified.

3. The combination of frame A, pot B, gutter b^2, outlet-pipe *b*, faucet *b'*, step b^3, spider-frame G, pins *g*, pusher *g'*, brush H I, pipe C, shaft E, screw e^2, spring-agitators e^3, pinion *e*, gear *f*, shaft F, pipe D, and hopper *d*, all substantially as shown and described.

JOHN PETER SCHMITZ.

Witnesses:
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THOMAS E. FLYNN.