S. BEER.

AMALGAMATOR.

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1,095,071. Patented Apr. 28, 1914.

Fig. 1.

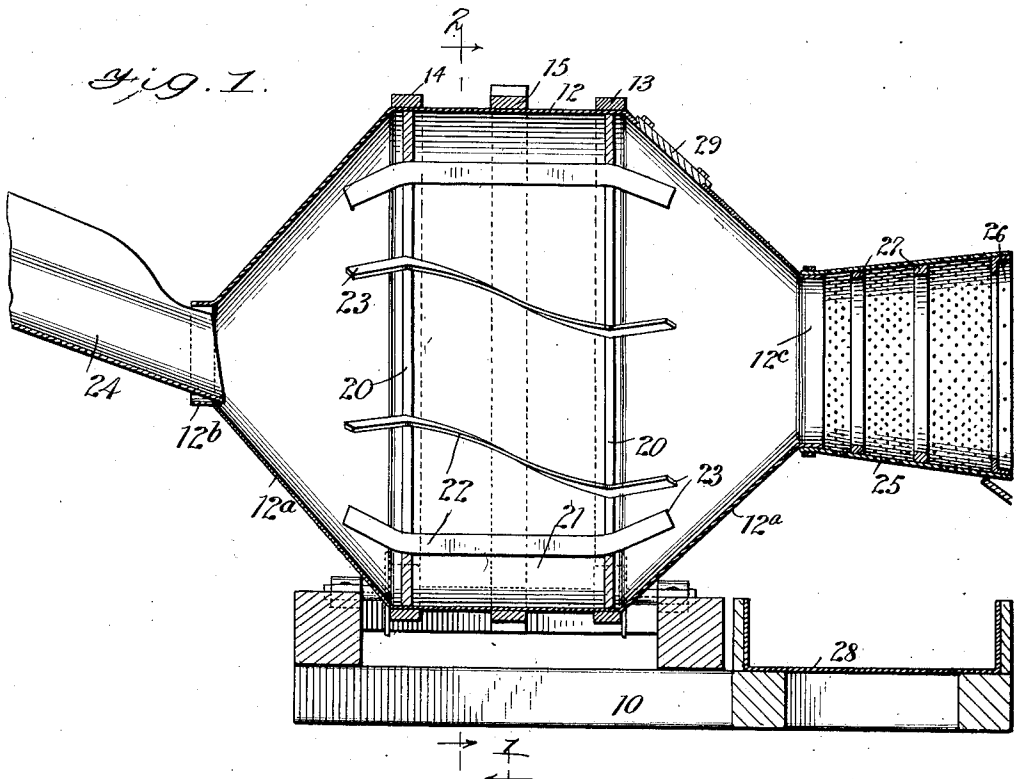
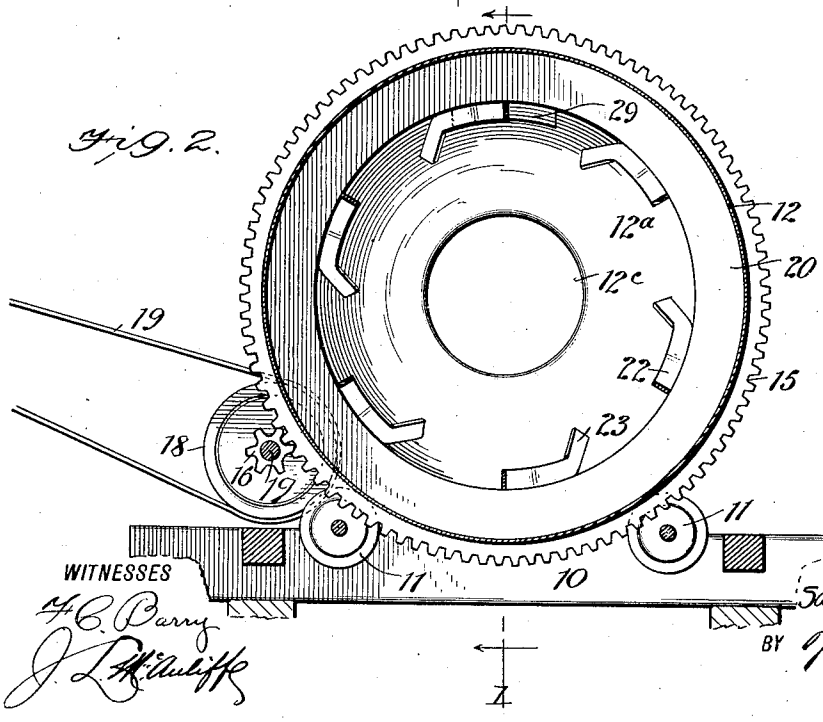


Fig. 2.



WITNESSES

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AMALGAMATOR.

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To all whom it may concern:

Be it known that I, SAMPSON BEER, a citizen of the United States, and a resident of Greenwood, in the county of Eldorado and State of California, have invented a new and Improved Amalgamator, of which the following is a full, clear, and exact description.

My invention relates to a gold saving device for the treatment of auriferous gravel, sand, tough clay and oxidized ores, to extract the gold therefrom.

It is a design of my invention to provide a device that will be efficient in the treatment of gravels and the like that have been previously washed, and to recover therefrom the "rusty" gold formerly lost, owing to the formation of rust on the gold-bearing material which resisted the amalgamating action in the operation of the ordinary apparatus.

It is a further design of my invention to provide a device of the indicated character, within the means of the private placer or quartz load miner, while at the same time capable of embodiment in apparatus of large size for the larger operator.

It is a further design of my invention to provide an amalgamating apparatus that will result in a higher saving of gold with decreased cost.

The invention will be particularly explained in the specific description following.

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

Figure 1 is a longitudinal sectional elevation on the line 1—1 of Fig. 2, of a gold-saving device embodying my invention; and Fig. 2 is a cross section on the line 2—2 of Fig. 1.

In constructing a gold-saving device in accordance with my invention, a suitable framework or support 10 is provided, having mounted therein pairs of friction rollers 11. On the rollers 11 is supported to revolve a shell or drum 12, having annular tires or exterior rings 13, 14, thereon, resting on the said friction rollers. The central portion of the shell or drum 12 is cylindrical, while the ends 12^a taper, being in the form of truncated cones, and the rings 13, 14, are disposed at the ends of the cylindrical portion adjacent to the truncated ends 12^a.

Between the rings 13, 14, and disposed centrally of the shell, is a toothed ring 15, meshing with which is a spur pinion 16 on a shaft 17, the shaft being driven in any suitable manner, here shown as by a pulley 18 over which a belt 19 passes to any suitable source of power (not shown).

Within the shell 12 adjacent to the ends of the central cylindrical portion are provided rings or annular flanges 20, disposed radially and forming with the shell, an annular depression or continuous channel 21. On the internal rings 20 are suitably secured deflecting elements 22, in the form of blades or bars, which are spirally disposed for the major portion of their length, the ends 23 being deflected on convergent lines in the direction of the ends of the shell.

The inlet end of the shell is provided with a neck 12^b that receives the feed chute or hopper 24 for delivering the material to the shell. The opposite end constitutes a discharge outlet for the shell and is formed with a neck 12^c, to which is secured a tubular screen 25, said screen flaring slightly outwardly. The inlet 12^b is somewhat smaller in diameter than the outlet 12^c so that the discharge level will be below the inlet. The screen 25 is formed at its outer end with an internal annular rib or flange preferably L-shaped or angular in cross section, so that the said bar constitutes a strengthener for the screen and in a measure, a riffle. The screen is further provided interiorly between the ends thereof with spaced annular riffles 27.

My improved apparatus has proven highly efficient in recovering gold from materials that have been repeatedly passed through ordinary washing and amalgamating machines, particularly with respect to recovering gold from particles having a deposit of rust thereon. The improved results are explained by the fact that the material is subjected in my machine to a very effective abrasive action which removes or breaks up the covering of rust and renders the gold more readily amalgamable; whereas the ordinary machines in which the abrasive action is not so effective, leave the gold particles improperly cleaned of rust and hence less liable to attack by the quicksilver.

In operation the quicksilver is supplied to the shell through the inlet 12^b, and the gravel or other gold-bearing material and water are similarly fed through the inlet by means of the hopper 24 or the like. The shell, being turned through the medium of the toothed ring 15 and pinion 16 or equivalent means, the gold bearing material is continually turned over and agitated. The depth of the trough 21 is such that in no case will rocks wedge themselves behind the deflecting blades 22. In the turning of the shell the rocks and other waste materials will gradually be deflected toward the discharge end of the shell by the blades 22, 23, it being understood that the speed of revolution of the shell will vary with the nature of the materials being treated, but in no case will the speed be sufficient to cause the quicksilver to pass to the discharge end 12^c.

The efficiency of the machine resulting from the increased abrasive action produced, and the thorough exposure of the particles to the amalgamating material, is due to the form of the shell with its cylindrical center and truncated conical ends as well as the formation of the annular trough at the cylindrical portion at the back of the deflector blades, so that the latter are disposed at the inner open side of the trough. This position of the blades relatively to the trough and shell, not only contributes to the increased abrasive and amalgamating results, but largely protects the bottom of the trough from the blows of the rocks in the material. Added efficiency is given to the machine by the annular screen and its riffles arranged to turn with the shell. The rocks being washed over the riffles of the screen serve to jar the latter and keep it clean. The finer gold bearing particles not amalgamated in the body of the shell will escape through the meshes of the screen onto any ordinary amalgamating plate 28, while the rocks and other waste products will pass out of the discharge end of the screen. The finer particles are subjected to an abrading action in the screen and in being passed through the latter, so that they are more susceptible to amalgamation on the plate 28. Clay lumps from gold bearing strata can be successfully broken up by my device and values obtained.

The results, it will be observed, are obtained by a construction which involves a minimum cost for manufacture, operation and up-keep.

For the removal of the amalgam a door is provided in the drum or shell, here shown as indicated by the numeral 29, and is located in the conical discharge end adjacent to the cylindrical portion.

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

1. A device of the character described, comprising a shell or drum having truncated conical ends formed respectively with an inlet and an outlet, the intermediate portion of the shell being cylindrical and formed with an annular trough or channel, and spiral blades at the inner, open side of the channel, the ends of the blades being deflected on convergent lines.

2. A device of the character described, comprising a shell having tapered ends and a cylindrical intermediate portion, said shell being mounted to revolve and being provided interiorly with fixed rings at the ends of the cylindrical portion, said rings forming an annular trough or channel, and spiral blades supported on the inner edges of the fixed rings and bridging the channel, said blades projecting beyond the rings and being spaced from the shell at both the cylindrical portion and the tapered ends.

3. A device of the character described, comprising a shell having tapered ends and a cylindrical intermediate portion, rings in fixed relation to the shell at the interior thereof, and disposed adjacent to the ends of the cylindrical portion, said rings forming a channel at the cylindrical portion of the shell, and fixed spiral blades on the said rings at the inner periphery thereof, the blades being spaced from the cylindrical portion of the shell and extending at their ends beyond the rings, the said projecting ends being deflected inwardly at an angle to the central portions of the blades.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMPSON BEER.

Witnesses:
FRED M. HUNTON,
IMELDA MCCARTHY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."