

(No Model.)

A. G. TINGMAN.
APPARATUS FOR COLLECTING GOLD FROM MOVING WATER CARRYING
AURIFEROUS MATTER.

No. 537,556.

Patented Apr. 16, 1895.

Fig. 1.

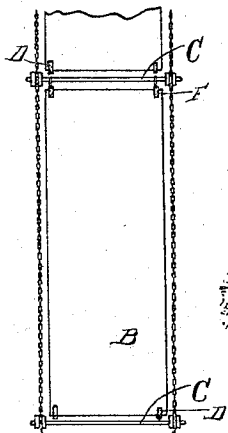
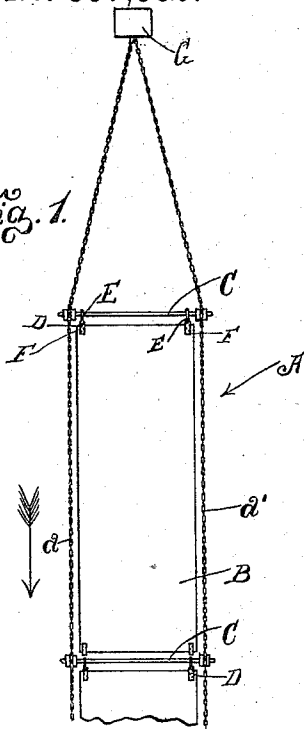


Fig. 2.

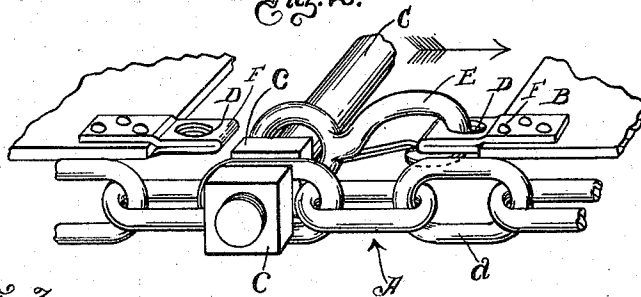
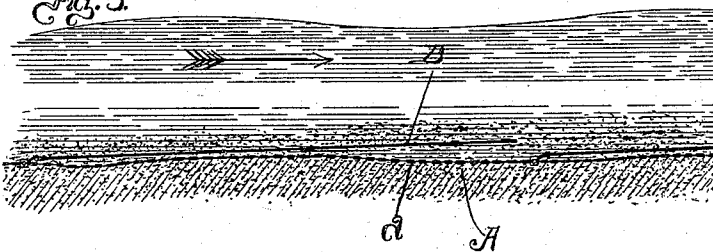


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALBERT GARDNER TINGMAN, OF INDIO, CALIFORNIA.

APPARATUS FOR COLLECTING GOLD FROM MOVING WATER CARRYING AURIFEROUS MATTER.

SPECIFICATION forming part of Letters Patent No. 537,556, dated April 16, 1895.

Application filed December 31, 1894. Serial No. 533,425. (No model.)

To all whom it may concern:

Be it known that I, ALBERT GARDNER TINGMAN, a citizen of the United States, residing at Indio, in the county of San Diego and State of California, have invented new and useful Improvements in Apparatus for Collecting Gold from Moving Water Carrying Auriferous Matter, of which the following is a specification.

It is well known that the débris carried by many streams contains, in the aggregate, large quantities of gold, and where the formation is favorable this gold and the débris deposits and forms placer ground. In many instances this gold is so fine that it does not deposit at any point, but is carried constantly onward with the sand and other débris flowing in the stream, and is finally swept into the sea and lost beyond recovery. It is well known that in the Sacramento river, the Colorado river and in many other streams there is a large amount of gold carried by the sand, slickens, or mud of such streams and it has heretofore been found impossible to devise for collecting such gold, any means which does not cost more than the gold which is recovered.

The object of my invention is to provide a cheap, simple and efficient apparatus for collecting the gold from the débris carried by bodies of moving water.

By my invention I am enabled to practice a successful method of collecting gold from moving water carrying auriferous matter which consists in anchoring upon the bed of such water a movable amalgamating plate adapted to amalgamate the gold carried by the auriferous matter, and afterward raising the plate from the water and removing the amalgam therefrom.

My invention consists of the device for collecting gold from moving water carrying auriferous matter which consists of a flexible anchoring device adapted to be arranged in the water and a plate adapted to be secured to such anchoring device, and coated with amalgamating material adapted to amalgamate the gold in the auriferous matter carried by the water.

My invention also comprises the various combinations of parts hereinafter described and claimed.

The accompanying drawings illustrate my invention.

Figure 1 is a fragmental plan view of a device embodying my invention ready for use. Figure 2 is an enlarged fragmental perspective view showing the means of securing the amalgamating plate to the flexible anchoring device. Figure 3 is a fragmental view of my device in operation.

It has been proposed to collect the gold from the débris carried by rivers such as the Sacramento river, raising the débris from the bottom of the river by means of a dredger arranged upon a boat and passing it over amalgamating plates arranged in suitable sluices and afterward returning the débris to the river. This method is very expensive for the reason that sufficient power must be supplied to lift large quantities of matter to a considerable height before it can be passed over the plates and the gold collected therefrom. The percentage of gold contained in the débris moving in such streams is ordinarily so small as to preclude the successful practice of this method. I avoid the expense and labor of elevating this waste material by anchoring in the bed of the stream, by means of a flexible anchoring device A such as a chain or rope an amalgamating plate B coated with quicksilver or other amalgamating material, and adapted to amalgamate the gold carried in the débris. By using a flexible anchoring device the plate is adapted to be conveniently raised from and replaced in the water and is free to move under the action of the current. Where the current is moderately swift the sand will deposit upon the plate at some points and the water will cut out the sand beneath the plate at other points, so that one side of the plate will settle and the other side will rise until by this shifting of the plate the current is directed to remove the sand from beneath the elevated side of the plate and to deposit it beneath the depressed side thereof, thus causing constant shifting and settling of the plate and an agitation and disturbance of the débris in the bed of the river.

It is well known that gold flows or runs with the heavier or lower strata of the débris carried by the water and by arranging the plate free to move under the action of the water, the plates rise and sink and cause this lower

strata to be disturbed and directed toward the top and this agitation brings the gold which is in this lower strata into contact with the plates and it is amalgamated and saved. In practice I propose to ordinarily employ a series of from ten to fifteen plates, arranged in line with each other and secured to two parallel chains *a a'* which are arranged at a distance from each other and retained in their alignment with each other by means of connecting rods *C* which are secured to the chains by means of jam nuts *c* as shown in Fig. 2.

It is well known that after a plate is charged with quicksilver it will only amalgamate a certain amount of gold, and as soon as the amalgam becomes stiff and hard the gold which is brought into contact with the plate will not amalgamate but will pass onward with the débris. For this reason it becomes necessary to clean the plates quite often and recharge them with quicksilver, or to feed the plates as it is called, by supplying more quicksilver to them. In stamp mills the plates are recharged by feeding the quicksilver into the battery and by this means a long run may be made and the plates will collect and amalgamate practically all the free gold in the ore. Where the plates are anchored in a running stream or in a moving body of water it becomes impossible to recharge the plates in this manner, and therefore it is necessary to frequently remove the plates from the water and to recharge them, and afterward replace them in the stream. Where the water is of any considerable depth this has been a matter of such difficulty that so far as I am aware it has never heretofore been attempted, but by my invention I have avoided this difficulty and so arrange my device that two men can conveniently remove a large number of plates from the water, clean, recharge, and replace them in position in a very short time. This is only made possible by using a flexible anchoring device such as a chain or rope, for were the device rigid the weight of the water and the force of the current would preclude the possibility of raising the plates from the water for the purpose of cleaning and recharging. For facilitating this operation of removing and recharging the amalgamating plates, I provide each corner of the plate with an eye *D* through which is snapped a snap *E* which is secured upon the rod *C* as shown in Fig. 2. These amalgamating plates are made from pure copper and are very soft and if anchored by means of eyes cut into the material of the plate, the constant shifting and wearing of the snap which secures the plate to the anchoring device would soon cut through the plate and it would thus become detached from the anchoring device and lost in the water. For this reason I rivet to each corner of each amalgam plate, a strengthening plate *F* of material harder than the amalgamating plate, and in this strengthening plate I provide an eye *D* to receive the snap. Thus the wear of the snap is brought upon the hard ring of the

strengthening plate and all danger of losing the plate from the anchor is avoided.

It is desirable that the amalgamating plates do not rub against the anchoring device, whereby the amalgam might be disturbed by the chain, and the plates become scarred and worn. I have shown in the drawings the anchoring device which I deem the best for the purpose. This consists of two chains secured together by means of the cross rods *C* arranged along the chains at such a distance apart as to allow the amalgamating plates to be secured to one rod and to swing between the side chains and to swing past the next rod in the series without contact therewith.

Snaps *E* and eyes *D* may be provided to secure all four corners of the amalgamating plate to the chain, and it may be attached by such snaps and eyes both fore and aft so that it is thereby prevented from being swung or moved too violently by the action of the water. I consider however that where the water is swift it will be better to attach the plate to the rod only at its forward end so that when the chain is elevated from the water for the purpose of removing the plates therefrom, the lower end of each plate may swing out at an angle to the chain in response to the action of the current of the stream and thus avoid the heavy strain which would be brought to bear upon the plate were it held rigidly at an oblique angle with the current of the flowing stream.

It is my intention to provide a suitable boat (not shown) and to arrange upon this boat a grapnel and a windlass whereby the chain, which is securely anchored at each end by suitable anchors *G G'* may be grappled at its up stream end and raised from the water, the chain detached from the upper anchor *G* and secured to the windlass and the plates successively removed from the chain as the boat is dropped down stream, winding the empty chain upon the windlass. When all the plates have been removed from the chain, they are cleaned and recharged and the operation of replacing them is performed in the reverse manner to that of removing them from the chain, the boat being pulled up stream as the chain is dropped into the water.

My invention is especially adapted for use in streams of running water, but it may be applied for the purpose of saving gold in the sands of the seashore, by anchoring the device where the waves will have effect thereupon and cause the auriferous sand to be washed over and upon the plates. I consider a chain the most desirable device for anchoring the plates in the water, for the reason that the water washing against the chain will be deflected and caused to cut into the sand or bed of the creek and to throw the auriferous matter upward so it will pass over the amalgamating plates. However it is to be distinctly understood that I do not limit my invention to any especial mode of anchoring the plates in the water nor to any especial ma-

terial for making such anchoring device, nor to any particular manner of detachably securing the plates to the anchoring device, but that my invention is designed to cover all means whereby an amalgamating plate may be anchored in a natural body of moving water, and removed from the water for the purpose of cleaning and recharging.

I also claim the amalgamating plate provided with the strengthening plate of harder material than the amalgamating plate, secured thereto by riveting and arranged to be attached to the anchoring device, whereby all danger of loss by wearing away of the snap eye is avoided.

The length of time the plates will be permitted to remain in the water before cleaning and recharging depends upon the amount of free gold carried in the débris, but ordinarily it is my intention to clean and recharge the plates every day.

My invention is to be distinguished from those devices in which the water and auriferous matter are confined in a sluice having amalgamating plates fixed in its bottom, for in such devices the amalgamating plates do not move under the action of the water, and the flow of water is shut off when it is desired to clean the plates, and the plates may be fed without loss by placing quicksilver in the sluice above the plates, and it is to be understood that my invention is not to be construed to cover such devices, but my invention consists of anchoring upon the bed of a moving body of water, a plate which is anchored in such a manner that it is free to move vertically and to sink into the sands or débris forming the bed of such water, thus to cause such débris to pass over the plate instead of under it.

Furthermore, my invention is not limited to saving gold alone from bodies of moving water but it may be applied to saving any other material flowing in the débris of a stream or

other body of moving water, and capable of being amalgamated.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The apparatus for saving gold set forth which consists of the flexible anchoring device, and a series of plates each secured by one end to such flexible anchoring device and adapted to swing freely in response to the action of the flowing water.

2. The apparatus for saving gold, comprising two chains or other flexible anchoring members separated from each other by means of cross bars, and an amalgamating plate arranged between the two members and each pair of cross bars, and secured thereto.

3. The apparatus for saving gold consisting of an amalgamating plate, and means for anchoring the plate upon the bed of a moving body of water and arranged to allow the plate to sink into the bed thereof and to be raised therefrom.

4. In an apparatus for saving gold, the combination of the flexible anchoring device provided with the snaps, and the amalgamating plate provided with the eyes adapted to receive the snaps.

5. In an apparatus for saving gold, the combination of the flexible anchoring device provided with the snaps, and the amalgamating plate provided with the strengthening plates riveted to the amalgamating plate and each having an eye adapted to receive one of the snaps.

6. The amalgamating plate set forth provided with the strengthening plate riveted thereto and having a snap receiving eye therein.

ALBERT GARDNER TINGMAN.

Witnesses:

ALFRED I. TOWNSEND,
JAMES R. TOWNSEND.

It is hereby certified that in Letters Patent No. 537,556, granted April 16, 1895, upon the application of Albert Gardner Tingman, of Indio, California, for an improvement in "Apparatus for Collecting Gold from Moving Water Carrying Auriferous Matter," errors appear in the printed specification requiring correction, as follows: In line 4, page 1, the words "San Diego" should read *Riverside*, and in line 86, page 2, the word "eyes" should read *eyes*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 21st day of May, A. D. 1895.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

JOHN S. SEYMOUR,
Commissioner of Patents.