

Aug. 30, 1927.

1,640,565

A. C. DENNIS

PLACER MACHINE

Filed Aug. 18, 1926

3 Sheets-Sheet 1

Fig. 1.

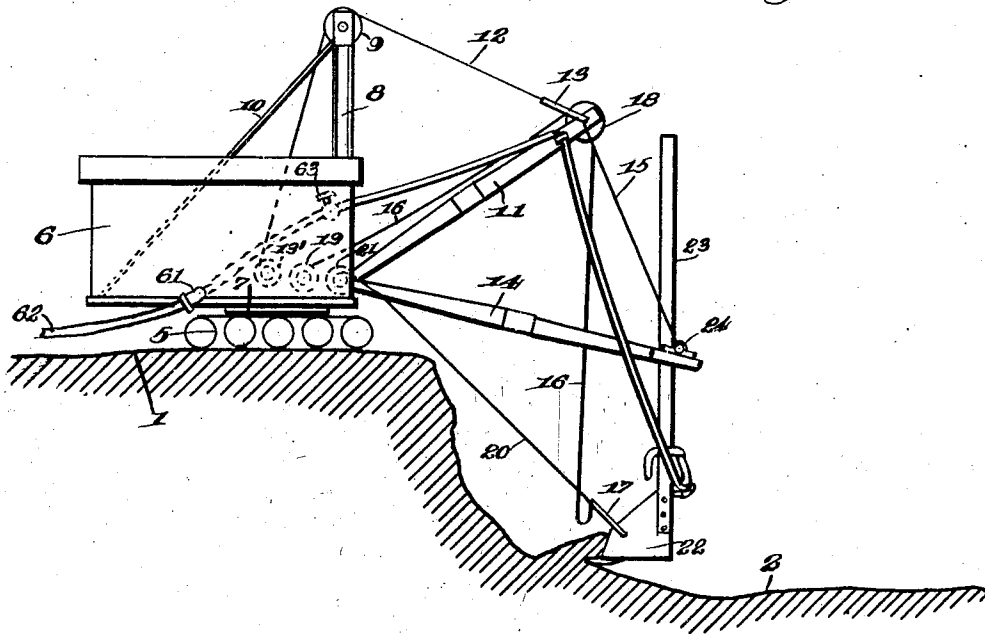
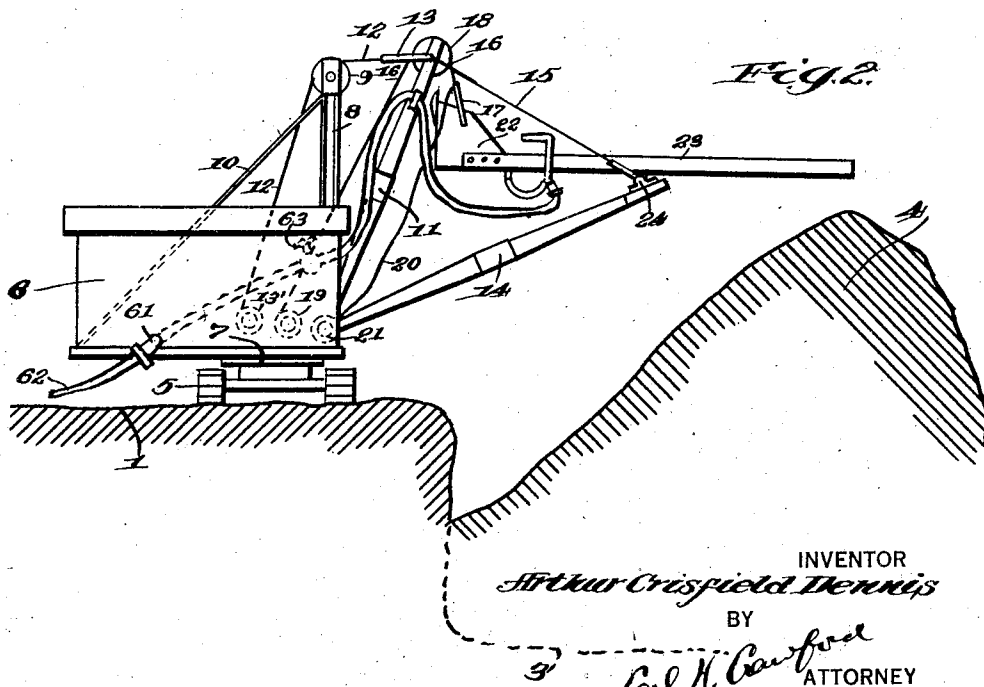


Fig. 2.



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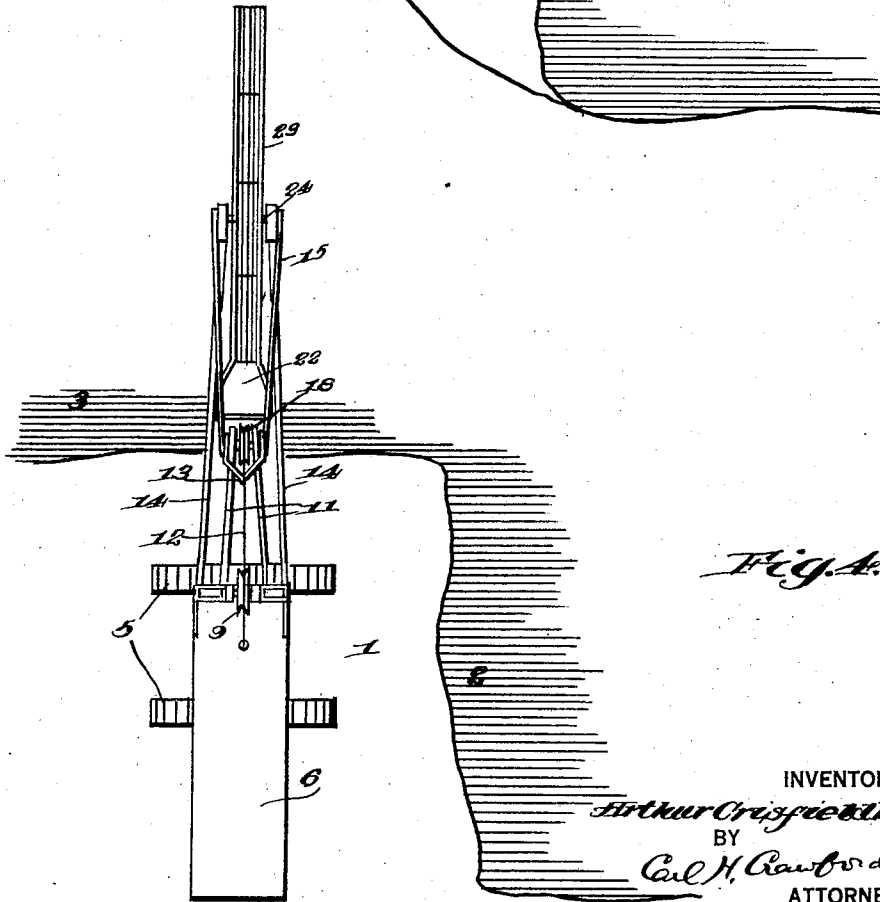
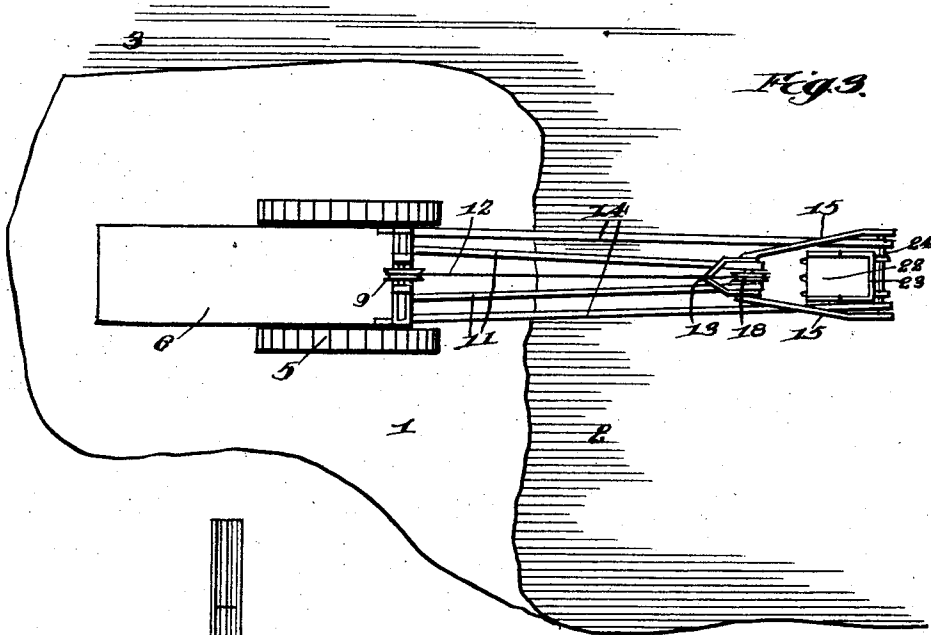
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3 Sheets-Sheet 2



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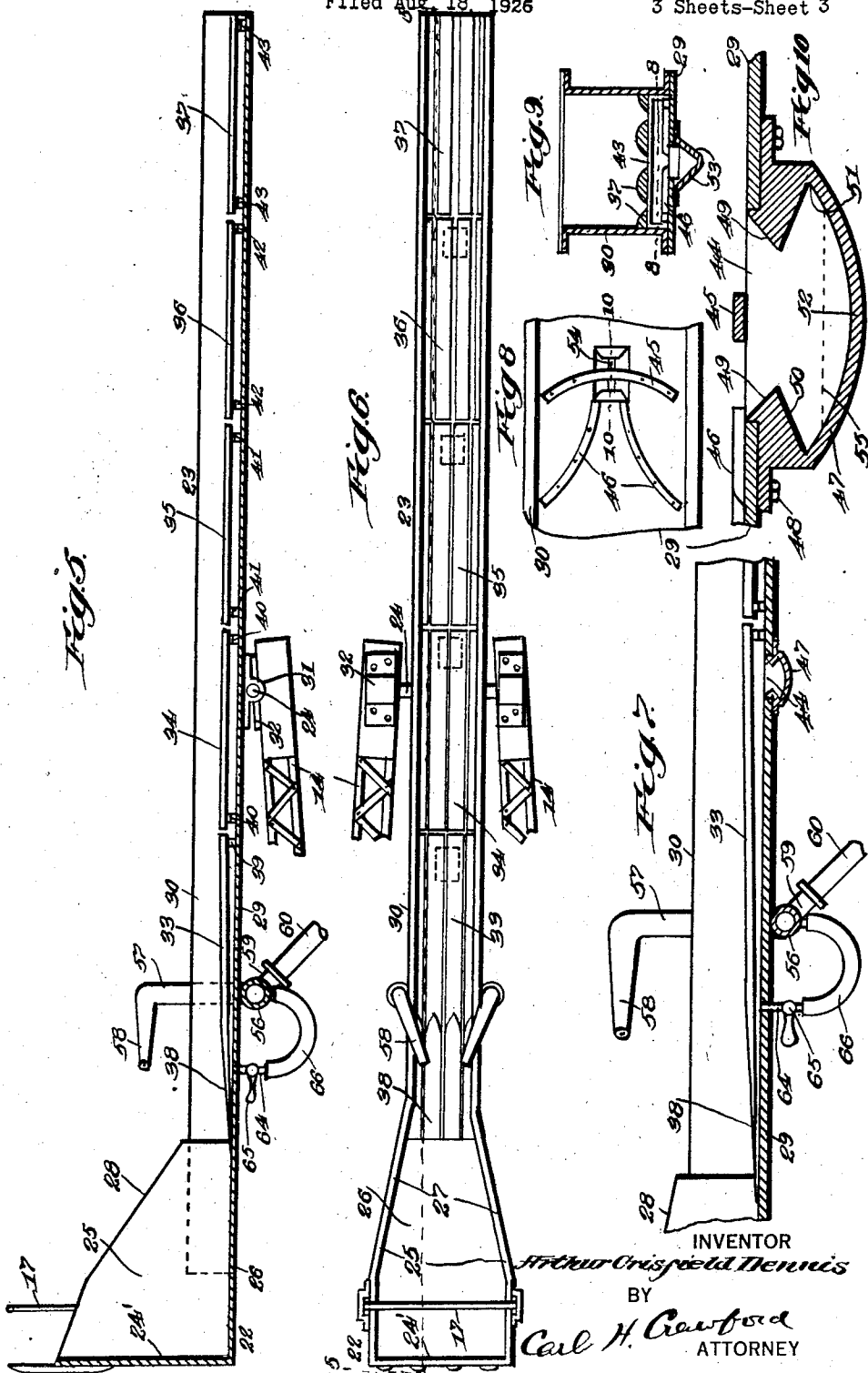
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE.

ARTHUR CRISFIELD DENNIS, OF PIEDMONT, CALIFORNIA.

PLACER MACHINE.

Application filed August 18, 1926. Serial No. 129,997.

The object of this invention is to provide a novel placer mechanism for working deposits that are either too shallow or too small in volume to warrant the erection of a floating dredge, and which are too flat to provide storage for tailings for hydraulic operations, and where adequate water supply is not available.

One of the objects of the invention is to provide a swivelled or turnable operating apparatus, which is desirably portable, and which is adapted to occupy one position when dredging the deposit, and be turned to another position to discharge the tailings at a point remote from the deposit being worked.

A further object is to provide a novel bucket-slucce structure so coordinated and operated that after a charge of the deposit has been scooped by the bucket, the tailings can be discharged through the sluice, and recovery of values made as the tailings are discharged.

It is a further feature of my invention to equip the bucket with a sluice that will function as the usual stick of the bucket whereby the bucket-slucce structure may be operated through the medium of the stick, the latter also performing the additional function of a sluice.

A feature of my invention resides in nozzle means carried by the bucket-slucce structure whereby a supply of water may be discharged into the structure to facilitate egress of the tailings, this feature of my invention including means for discharging water above and below the mineral savings devices with which it is a novel feature to equip my improved stick-slucce.

My invention has many other features and objects which will be more fully described in connection with the accompanying drawings and which will be more particularly pointed out in and by the appended claims.

In the drawings:

Fig. 1, is a view in side elevation showing the position of the parts when the mechanism is in the act of scooping a charge of the deposit.

Fig. 2, is a view in side elevation after the charge has been scooped and showing the mechanism ready for sluicing this view being one looking from the right of Fig. 1, after the mechanism has been turned to deposit the tailings on the dump.

Fig. 3, is a plan view of the device as shown in Fig. 1.

Fig. 4, is a plan view of the device shown in Fig. 2.

Fig. 5, is an enlarged longitudinal sectional view of the bucket-slucce structure taken on line 5—5 of Fig. 6.

Fig. 6, is a plan view of the structure as shown in Fig. 5.

Fig. 7, is an enlarged longitudinal sectional view of a portion of the sluice trough.

Fig. 8, is a plan sectional view on line 8—8 of Fig. 9.

Fig. 9, is a transverse sectional view of the sluice.

Fig. 10, is an enlarged sectional view on line 10—10 of Fig. 8.

Like characters of reference designate similar parts throughout the different figures of the drawings.

In Figs. 1 to 4, I have shown a location in which a ledge is indicated at 1, and the pit in which the deposit is being worked, is indicated at 2. I have indicated at 3, the pit in which the deposit has previously been worked out, and which is now being used as a tailings dump, the tailings dump being indicated at 4, in Fig. 2.

On the ledge, I have shown one form of my improved mechanism, the same, in the present construction, involving a track laying truck or caterpillar 5, on which a dredge power house 6, is turnably mounted as at 7. The manner in which power is applied to portably advance the mechanism toward the work and into position, and the means for turning the power house 6, on the truck, are not specifically important as they only enter broadly into the combination, and further, such mechanism is now in common use, and therefore will not be shown in detail. It is sufficient to state that the power house is turnable on its truck 5, throughout any degree of a complete circle, and is self propelled.

A spar 8, rising from the house 6, carries an elevated sheave 9, and the spar 8, is suitably braced as indicated at 10. A crane is indicated at 11, and the same is suitably mounted to be swung into various positions of inclination from the power house 6. I have shown a crane operating cable 12, connected at 13, to the crane 11, and being trained over sheave 9, and down into the power house over a windlass 13', that is suitably power driven. A sluice-bucket

operating boom 14, is also suitably mounted at its inner end on the house 6, to be swung to various positions of inclination, upon movement of the crane 11. I have shown the boom 14, connected with crane 11, by a cable or cables 15, so that the boom will be held in fixed relation to the crane, by gravity, as will be clear from the drawings. A sluice-bucket operating cable 16, is connected with a bail 17, on the bucket, to be later described, and is trained over a sheave 18, carried by the outer end of crane 11. This cable 16, is operated by a power driven windlass 19, in the power house 6, and the function of this cable is to lift the bucket. A pull-bucket cable 20, is shown connected with bail 17 and extending to the power house 6, where it is operated by a power windlass 21.

Reference will next be made to my improved bucket-sluice structure, and I will first describe the same generally in its relation to the heretofore described operating mechanism, and thereafter, I will describe said structure in detail.

Said structure broadly consists of a bucket 22 having a stick which is in the form of a sluice 23, the sluice 23, as shown, being rigidly secured to said bucket and being adapted, in addition to its function as a sluice, to also perform all the functions of a bucket stick. Said sluice is shown pivoted or operatively connected with boom 14, at 24.

It will now be clear that when the parts are in the position shown in Fig. 1, the bucket is first actuated by the cable 20, to scoop up a charge of material, and then the cable 12, is paid in to elevate the crane 11, and boom 14, while the cable 16, is also paid in to tilt the bucket-sluice or sluice-bucket into the position shown in Fig. 2. Now it is not desirable or practical to discharge the tailings into the deposit pit being worked, therefore, the house 6, is turned on its truck so that discharge of the tailings can be made at a point remote from the deposit being worked and into a portion of the location that has previously been worked, or into any zone that will not interfere with the deposit being worked. Thus, I have shown a tailings dump 4, onto which the tailings from the bucket structure just described will be dumped, as shown in Figs. 2 and 4.

I will next describe in detail the construction of the bucket-sluice structure, reference being had primarily to Figs. 5 to 7.

The bucket 22, has an end or scooping wall 24', side walls 25, and a bottom wall 26. The side walls 25, converge, as indicated at 27, and slope, as at 28, toward the sluice 23. Said sluice 23, has a bottom wall 29 and side walls 30, which are contiguous with the side and bottom walls of the bucket and which form an elongated trough-like exten-

sion thereof, as will be clearly seen by reference to Figs. 5 and 6. The sluice 23 has fixed to its bottom wall suitable bearings 31 for pivot shaft 24, and the boom 14, which is in the form of two members, carries bearings 32, for said shaft 24. The shaft 24, is shown located about centrally between the ends of the bucket-sluice structure but the greater weight is at the bucket end, both as regards the structure itself and the load carried thereby. Hence it will be seen that the structure can be tilted on its pivot shaft 24 by cable 16, with the full assurance that gravity will always seek to lower the bucket end of the structure.

As thus far described, I claim the structure to be both useful and novel in some forms of work. However, I will next describe certain novel features of the structure which make the latter particularly useful and advantageous for the main function heretofore set forth.

I provide the chute 23 with mineral savings devices which, in the present form, consist in part of a series of longitudinally disposed riffles sets designated at 33, 34, 35, 36, and 37. The bucket end of the first set 33, slants toward and merges into the bottom wall 29, but the remaining sets are all at substantially the same elevation above said bottom wall and all but the first set 33, are of uniform length. I have shown the bucket ends of the first set of riffles 33 chamfered off, as indicated at 38, to facilitate movement of the material up onto the riffles at the start. I have shown the riffles supported at an elevation to the bottom 29, by means of U-bar supports 39 to 43 in order to afford sufficient space below the riffles and between the same and the bottom 29. Further, the spacing, laterally, of the integers of the riffles is gradually increased from the first set 33, toward the last set 37.

Below the riffles, and in the bottom wall 29, are disposed novel means for holding mercury, the construction of which is such that the mercury will be held in said means irrespective of any of the usual and practical positions to which the sluice 23 may be disposed, which is a feature that I consider novel.

At intervals subjacent each set of riffles, and preferably remote from the bucket ends thereof, I provide an opening 44, and as each device is the same in structure and operation only one need be described in detail. As shown more particularly in Figs. 8 to 10, I provide an arresting riffle 45, which extends over said opening 44, and laterally toward the sides of the sluice way. This riffle arrests and guides the values toward the mercury pocket, about to be described. I also provide riffles which are strictly guiding riffles and which are indicated at 46. Said guiding riffles converge from the sides of the

sluice way toward the opening 44. Thus, if any values pass over the guiding riffles 46, they will be arrested by the arcuate riffle 45, the main object being to cause the values to deposit into the mercury pockets.

As shown, my improved mercury pockets each comprise a double trapped receptacle 47, which may be secured to the bottom wall 29 as shown at 48. Said pocket has longitudinally disposed trap or overhanging portions 49, which project into the path of the opening 44, and preferably below the same. The lower faces of said trap portions 49, as indicated at 50, diverge longitudinally to the ends of the pocket walls 51, and the pocket wall 52, is dished downwardly below said trap portions. By reference to Fig. 9, it will be seen that the lateral walls 53, converge downwardly in such a manner that the mercury will normally be contained in a longitudinally disposed groove 54, which is more clearly seen in Fig. 8. I have indicated the mercury level at 55, in Fig. 10. It will now be clear that when the bucket-sluice structure is tilted into the scooping position shown in Fig. 1, the slight amount of mercury will be safely held in the pockets and will be prevented from running out, likewise the values amalgamated therein. It is desirable to attach the mercury pockets so that they will be easily removable for cleaning purposes.

The interdependence between a mercury pocket so formed that it will normally trap and prevent release of the mercury, in combination with a bucket-sluice structure that is tiltable from a scooping to a sluicing position, will now be clear.

As shown in Fig. 9, the tops of the longitudinal riffles are preferably convex so that movement of the material between the same will be facilitated.

I have provided means for sluicing out the contents of the bucket through the sluicestick which I will next describe in detail.

I have shown a U-pipe 56, suitably mounted on the sluice bottom 29, the limbs 57 thereof extending upwardly and terminating in nozzles 58 which preferably converge in a manner to direct the streams of water toward the wall 24', of the bucket. Said pipe has a hose extension 59, to which a hose 60, is connected, said hose 60 may have an intermediate portion thereof loosely or otherwise secured to the crane 11, the hose extending therefrom to the house 6, and having a terminal at 61. A supply hose 62, is shown connected with said terminal 61 and a valve may be located at any convenient position, as indicated at 63, so that the water may be turned on from the house 6, when it is desired to sluice the material in the bucket. The nozzles 58 are intended to supply water to sluice the contents of the bucket over the riffles but should a sufficient supply of water

be lacking to keep the material in motion, I may add an additional supply in a different location. For instance, I have shown a pipe 64, extending through bottom 29, below the riffles, and having a valve 65. I have shown pipe 64, connected by a hose 66, with pipe 56, to afford a water supply. Thus, it will be seen that I have provided means whereby a supply of sluicing water may be delivered above and below the riffles, simultaneously, or only above the same. It will be understood that the water used will be regulated with respect to the character of material being operated upon, as will be clear to those skilled in this class of work.

The longitudinal riffles are intended to let through the fines, the finest material going through between the first set, and each succeeding set letting through a larger size of material. The riffles are intended to afford a rough segregation, the heavier particles being liable to crowd to the bottom and force their way through, while the excess light fines and all coarse material will be washed along on top of the riffles.

It is believed that the invention will be fully understood from the foregoing description and while I have herein shown and described one specific form of my invention, I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:

1. In a placer machine, a bucket-sluice structure comprising a bucket having a sluice contiguous thereto, said sluice having mineral savings devices therein, and mechanism for tilting said structure into and causing said bucket to scoop a charge of the deposit and then tilting said structure into a position to discharge the contents of said bucket through said sluice and over said mineral savings devices.

2. In a placer machine, a bucket-sluice structure comprising a bucket having a mineral savings sluice contiguous thereto, mechanism for tilting said structure into causing said bucket to scoop a charge of the deposit and then tilting said structure into a position to discharge the contents of said bucket through said sluice, and means carried by said sluice for discharging water into said bucket to facilitate discharge of the tailings contents of the latter through said sluice.

3. In a placer machine, a bucket-sluice structure comprising a bucket having a sluice contiguous thereto, said sluice having mineral savings devices therein at an elevation above the bottom of said sluice, mechanism for tilting said structure into and causing said bucket to scoop a charge of the deposit and then tilting said structure into a position to discharge the contents of said bucket through said sluice, and means for discharging water into said structure above and be-

low said mineral savings devices to facilitate discharge of the bucket contents through said sluice and recover the values and discharge the tailings.

- 5 4. In a placer machine for shallow locations, a turnable apparatus including a bucket-sluice structure comprising a bucket having a mineral savings sluice contiguous thereto, mechanism for tilting said structure into and causing said bucket to scoop a charge of the deposit and then tilting said structure into a position to discharge the tailings contents of the bucket through said sluice, said apparatus being turnable to cause said sluice to stack the tailings at a point remote from the deposit being worked.

- 10 5. In a placer machine, a bucket having a mineral savings sluice-stick operatively contiguous thereto, and mechanism connected with said bucket and sluice stick for causing said bucket to scoop a charge of the deposit and then tilting said bucket and its sluice-stick into a position to discharge the tailings contents of said bucket through said sluice-stick.

- 15 6. An article of manufacture for a placer machine of the class described, comprising,

a bucket provided with a sluice-stick rigidly connected therewith in contiguous relation thereto for passage of the contents of said bucket through said sluice-stick, said sluice-stick having mineral savings devices therein at an elevation to the bottom of said sluice-stick, and said sluice-stick having means for discharging water above and below or only above said devices to facilitate discharge of the material through said sluice-stick.

7. In a placer machine, a bucket-sluice structure, and mechanism tiltably supporting and operating said structure, the sluice portion of said structure having mercury pocket means for holding the mercury therein irrespective of the operative position of said structure.

8. In a placer machine, a bucket-sluice structure, mechanism tiltably supporting and operating said structure, and the sluice portion of said structure having sets of longitudinally disposed riffles therein of graduated and increasing spacing toward the discharge end of said sluice portion.

In testimony that I claim the foregoing as my own, I hereby affix my signature.

A. C. DENNIS.