



# THE ASSAY

THE SOUTHWESTERN PROSPECTORS AND MINERS ASSOCIATION  
- Founded 1934 -

Meetings on the Third Tuesday of Each Month  
VFW Post 2082  
2885 Lemon Grove Ave. Lemon Grove CA 91944

## President's Message

**Dec 2009**



the Del Mar Fair Booth awards too.

This is the last issue of the Newsletter for Verne Whidden as editor and I would like to thank him for doing a GREAT job on it. Over the years, Verne has found interesting and educational articles for our members to read. He has made sure the Newsletter always looked its best with at least four pages of info. each month.

Being the last month of this 75<sup>th</sup> Anniversary year, I believe we have done well. We have added 3 new claim areas to our list ( 1 Gem Claim area, 2 Gold claim areas ) to look for gold and gems. We continue to educate school children on the hobby of Gold Mining . Richard Seaney and crew are responsible for that activity. They do a great job every year.

At the Del Mar fair, we sold about 5% less than last year ,but because

the economy was so bad I feel this was a good outcome. What I saw was a big increase in interest in gold prospecting by the general public . And finally our monthly meeting programs were very educational and interesting with a good selection of Gold topics and related topics.

I would like to thank all the volunteers that helped the board run this Association because without you we would still be meeting in somebody's house. It is amazing that we are 75 years old this year and all the past volunteers that made this possible by donating their time and energy to get SPMA to this level of activity.

### Important Notice!!!

The General Meeting in **January** will be moved to **MONDAY** in order to accommodate an important VFW function. See Calendar on last page.

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### Future Activities

- ♦ **Dec 14th:** 6:30 pm: Board of Directors meeting @ Gem and Mineral Building in Balboa Park
- ♦ **Dec 15th:** 6:30 pm: General Meeting @ VFW Hall in Lemon Grove.
- ♦ **Jan 11th:** 6:30 pm: Board of Directors meeting @ Gem and Mineral Building in Balboa Park

### Upcoming Events

- ♦ Note: Check the Message Center for the latest outing information



The annual Christmas Party is here again. Seems like last week we were having last year's party. For our new members, the Assoc. provides the Turkey and Ham along with Refreshments and a limited supply of plates, utensils (good idea to bring your own). All side dishes are donated by the members and last year we had a good selection. Usually we have salads, deserts, vegetables, potatoes/ stuffing as groups. Call Kent Matthews or me if you plan to attend so we know how many people to expect at the party, and also what type of side dish you will bring. We have FREE door prizes to give away plus

## Future Meeting Programs

December : Annual Christmas Party, Awards Ceremony.

## SPMA Field Trips

**December 2009:** The SPMA club has its Christmas Dinner at the VFW hall at 2885 Lemon Grove Ave., Lemon Grove, CA 91944. The club supplies the main course and the members bring a dish to share. It's a lot of fun and time to reflect on the good times and the good field trips of club members.

## Raffle Results

We enlisted the help of our younger prospectors to help in the selection of the 5050 drawing, coordinated by Mr. Ed Farley and the Ways/ Means Raffle Ticket selection of winners, chaired & coordinated by Brian Winter.

Way Means Raffle Big winners were:

Bob Eads  
Maria Adams  
Craig Moody



## Your SPMA Officers for 2010

**President - Joseph JohaneK**

**Vice President - Brian Winter**

**Secretary - Roger Fuller**

**Treasurer - Robbe Ellison**

**Board of Directors (2 yr Term) Brian Turner**

**Thomas Cook**



# Operation of a Stamp Mill - Part 10

## Amalgamation Pans & Settlers

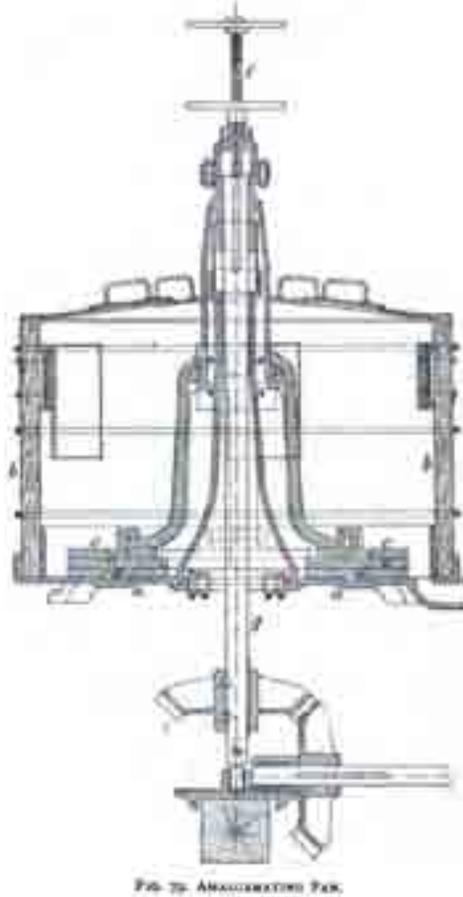
So far we have dynamited, shoveled, pulverized, shaken, and stirred the ore. Why would we need to do more?

While every cart of ore would have a different assay, the mill men knew roughly how much gold was supposed to be in a ton of ore. Fire assays tell the full amount of gold in the sample, regardless of how bound. A typical ore cart holds about 1.5 tons of rock. They could estimate how much ore they processed and how much gold they should have gotten. Mills were lucky to get to 80%. If they had nasty substances in the ore which interfered with amalgamation, they might get 35%. What happened to the extra gold?

Amalgamation relies on having clean, receptive mercury come in contact with the gold. The apron plates rely on gravity to bring the heavier particles to the bottom of the pulp (slurry) as it slides downwards. The vanner uses vibration to simulate a panning action and agitate the pulp to get the heavier particle to sink to the bottom where the particles ride the belt upwards and are washed off and collected.

For every particle of gold we can see, there are probably millions we cannot see. We also know about **Float Gold**; particles we can see, but which stick to the surface of our panning water and will not sink unless we break the surface tension with something like Jet-Dry concentrated soap.

*“Such gold will float almost indefinitely, that is to say, there is not sufficient mass in the particles to overcome the cohesion of water (surface tension)”*



*“In some experiments, water from settled tailings was drawn off and allowed to stand for 3 full days, but was still appreciably cloudy. The suspended matter was removed by filtration and assayed considerably higher than the ore supplied to the battery”.*

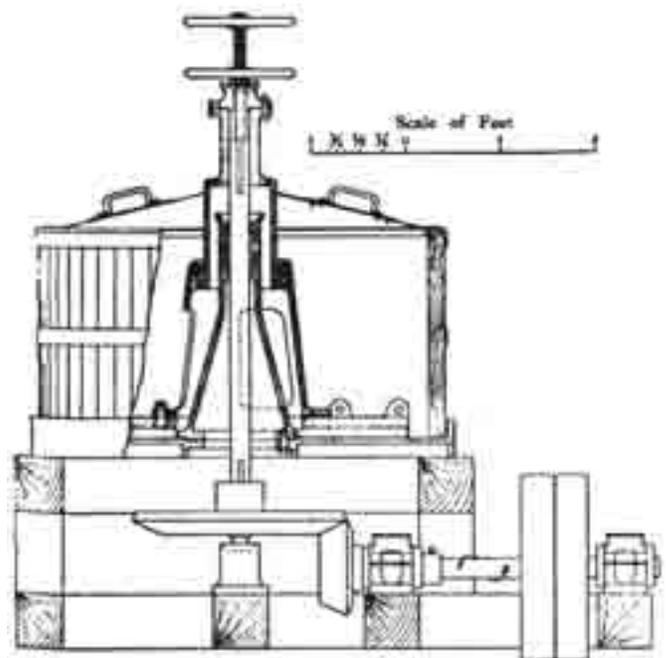
So why wasn't the tailing water just filtered? Filters fine enough to catch particles this small, catch almost everything, and clog very quickly. It just cannot be done on an industrial scale.

**Coated Gold** - Sometimes the gold is coated with a film of rust (iron oxide) or is jacketed by a black coating of a manganese compounds. It is rare to find auriferous minerals without some percentage of readily decomposed sulfides of copper, arsenic, or antimony. All of these interfere with amalgamation. In many mills quicklime was added to counteract the build up of these injurious chemicals.

At the very beginning of this series, I mentioned seeing equipment that I did not recognize in pictures of mills in Colorado. These were **Amalgamation Pans** and **Settlers**.

These machines were developed around 1858 and had been used in some California mills, however they were replaced by the Vanner Concentration tables during the 1870s and 80s.

They were used in the Washoe process pioneered in mills of the Comstock Lode because very fine crushing is needed for these ores.



# Operation of a Stamp Mill - Part 10

## Amalgamation Pans & Settlers

Coloradans resorted to these machines because of the silver, sulfides, and Tellurides in their ores.

Previously, we noted if there is too much Mercury, the amalgam will be soft and liquid. It will tend to be washed away in the flow of waste rock and take any values it has absorbed with it. If there are too many contaminants, the mercury can get surrounded by a coating that prevents amalgamation. A method is needed that allows a large amount of mercury to be added in a closed environment which prevents its escape, but insure it can overwhelm the contaminates.

The apron tables in Colorado mills tend to be short; intended primarily to collect the coarse gold. Vanners are often dispensed with entirely in favor of **Amalgamation Pans** and **Settlers**. How do these work?

Under agitation mercury is broken up into tiny spherical specks of liquid. Effectively mixing these with the ore can help bring the mercury in contact with the tiniest free gold particles. Once the agitation level is reduced or stopped, the mercury

specks sink and combine together to form a much larger mass of material.

Amalgamation Pans were 3-5 feet in diameter and had a powered agitator called mullers. The hand wheel at the top was to raise and lower the mullers. The mullers had metal shoes on them, so they could

The cut away diagrams on the opposite page, show the drive shaft coming up from underneath. The bottom was made of hard iron and the side were usually wood. The slurry from the apron plates was put in the tub, the mullers lowered and the contents ground (much like an arraster) for 4-6 hours. The

mullers rotated at 65-75 RPM. Once all the crushing was finished, the mullers were raised and another large amount of clean mercury was added. The agitation would disperse the mercury and aid amalgamation. The contents of two pans were directed to one Settler.

Settlers are similar in construction, but were larger and did no grinding. A typical arrangement of two pans and one settler is shown in the figure. Water is added to thin the mixture and the stirring is much slower at 15 RPM.

The idea is to let the mercury and amalgam sink to the bottom. A groove is cast in the bottom of the settler. The groove gets continuously deeper as it goes around culminating in collection pot where it could be drawn off for further processing



FIG. 223.—AMALGAMATING PLANT.

be lowered for ultra fine grinding against the pan bottom to liberate the maximum amount of native gold. The mullers could be raised if only agitation was desired. Steam could be injected from the bottom to heat the contents and promote chemical reactions.

the mercury and amalgam sink to the bottom. A groove is cast in the bottom of the settler. The groove gets continuously deeper as it goes around culminating in collection pot where it could be drawn off for further processing

**The End.**



**Southwestern Prospectors & Miners Association**  
 - Founded 1934 -  
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Annual dues are \$40 for new memberships and \$30 for renewal. Make check or money order payable to SPMA and send directly to Membership, PO Box 904 La Mesa, CA 91944-0904.

**The Post Office does not forward bulk mail. Please give us your new address if you have moved.**

**Note, Jan Meeting moved to Monday!!!**

The large, bolded squared second Monday of each month and month. The circled days are the club's

days are meeting nights ~ the board meets the the General Meeting is the third Tuesday of the scheduled outings.

**December 2009**

**January 2010**

Su	Mo	Tue	We	Thu	Fri	Sat
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>
<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>
<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>		

Sun	Mo	Tue	We	Thu	Fri	Sat
					<b>1</b>	<b>2</b>
<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>
<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
<b>31</b>						