

39: McCann’s small sluice – 1980s research in California

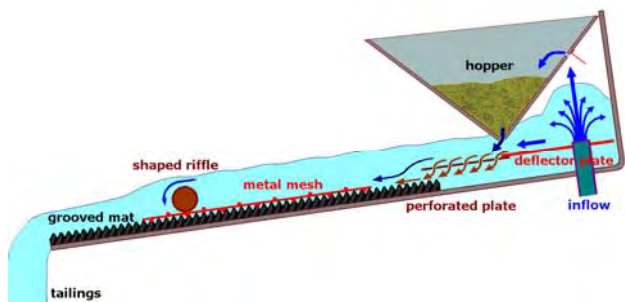


Figure 86. McCANN'S SMALL SLUICE
General arrangement, details omitted. (drawing: Robin Grayson)

McCann’s sluice was invented by John C. McCann of California and patented in 1985 (US #4,525,270). This was among the most outstanding innovations to the sluice made by recreational miners in North America and elsewhere who, since sometime before the 1970s, have been making incremental improvements to their small sluices in an effort to recover more fine gold. By the 1980s the innovative surge had become quite remarkable.

McCann’s sluice is a complete wash-plant satisfying a litany of wishes of recreational miners:

- ✘ small, lightweight, portable device;
- ✘ minimises water use by recycling;
- ✘ minimises energy consumption;
- ✘ has a good concentration ratio of 1,000:1;
- ✘ has an adjustable slope;
- ✘ maintains a steady flow;
- ✘ recovers 90-98% of visible gold; and
- ✘ recovers 60-80% of gold particles as fine as 30-40µ.

McCann’s sluice removes technical justification for mercury. Yet in over two decades since the device was patented and thousands sold to recreational gold miners worldwide, the device has been overlooked by researchers using public funds in efforts to improve large gold sluices for companies [90,91] and gold sluices for artisanal miners [21,26,92].

Operation

Feed is best screened at 2.5 to 5mm, although the manufacturer says no pre-screening is required. Pay gravel is fed by trowel either dry or wet into the feed hopper and the device will process about 136 kilos/hour of solids. Rather than the wash water being added from above, the wash water is added from three holes in the rear of the hopper. The resultant slurry passes through a static screen in the base of the hopper with shaped holes encourage a steady outflow.

Upon escaping from the hopper, the slurry encounters wash-water flowing over a deflector plate. The slurry and wash-water flow over a perforated plate that has numerous small holes through which dense fine particles fall into a quiet zone of slowly moving water that is where most of the fine gold tends to be caught. Larger particles pass down the main sluice lined with rubber v-groove riffles capture 90-98% of the visible gold, assisted by a section of fine expanded metal mesh and a single “shaped riffle”. The manufacturer recommends adding a heavy duty HFBE vibrator to assist recovery of fine gold.

Tailings water flows into a filter bag at the end of the sluice that retains the tailings and the cleaned water fills a heavy duty 5-gallon water bucket. From here the water is recirculated many times an hour by a small submersible pump (capacity 1.89m³/hour) requiring 1.5 amps at 12 volts allowing 20-30 hours use on a car battery.

Adoption by placer gold miners

McCann’s wash-plant is made by Micro-Sluice Gold Products of Wisconsin, USA (www.micro-sluice.com) and marketed as the Micro-Sluice, with over 3,700 units sold in 16 countries over the last 20 years. The device is popular with recreational gold miners and has potential for artisanal miners especially in arid regions.

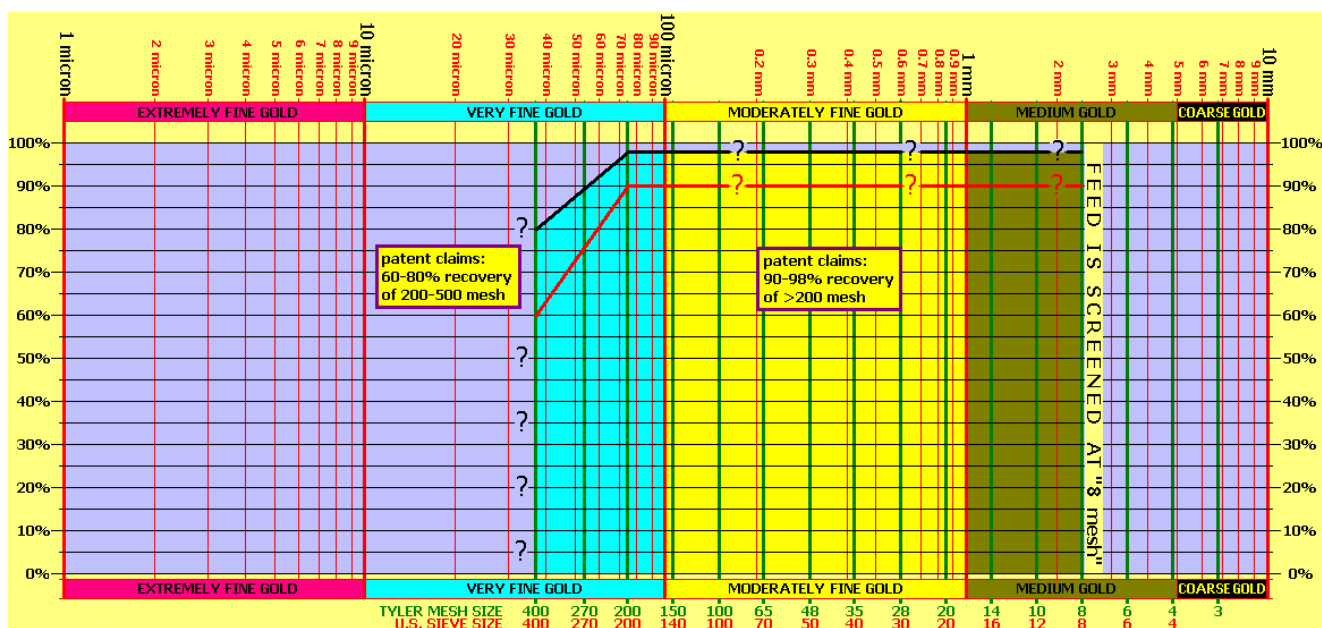


Figure 87. GOLD RECOVERY BY McCANN'S SMALL SLUICE
Recovery of placer gold by McCann's small sluice, according to the original patent. (compiler: Robin Grayson)