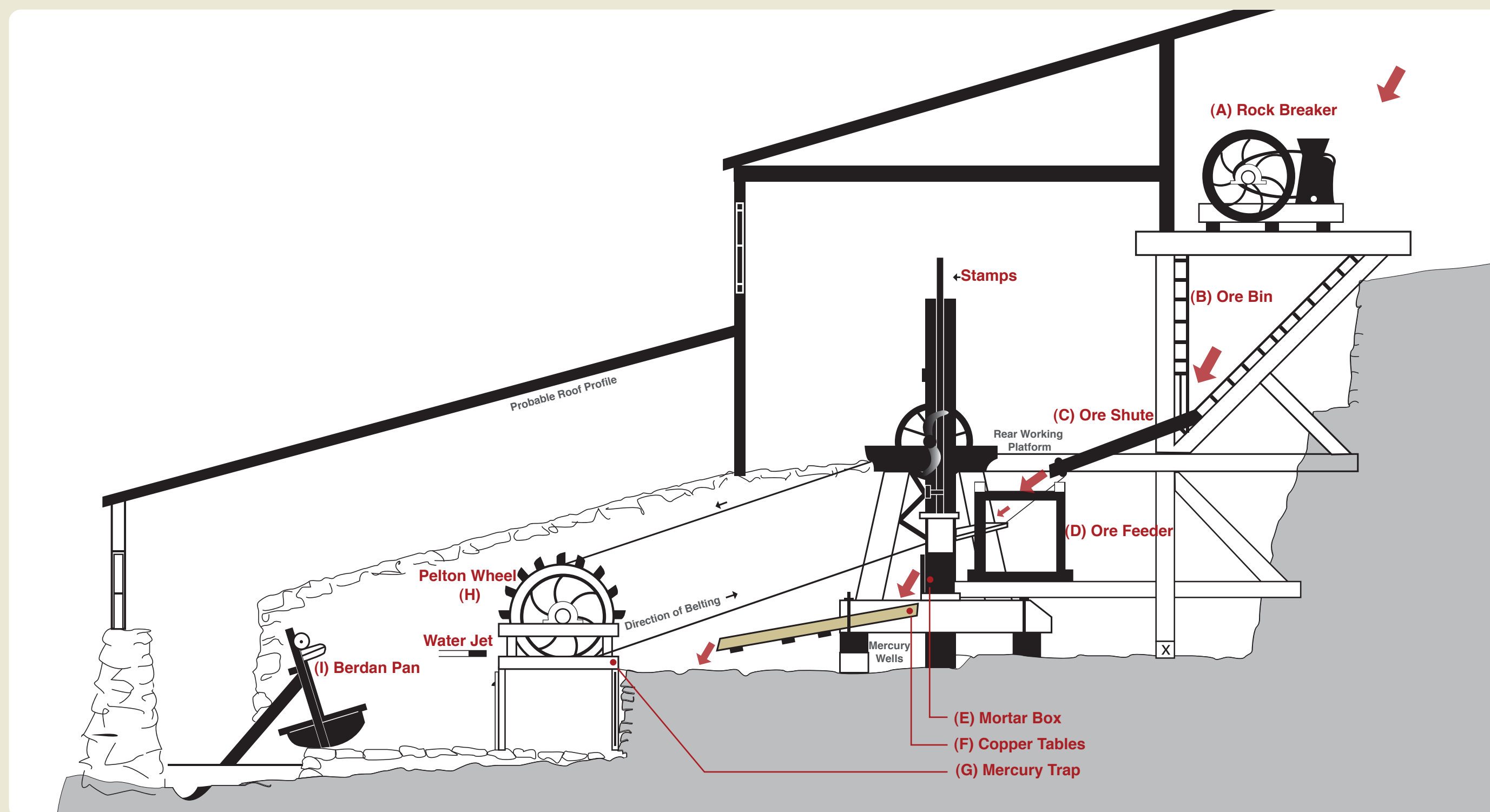


Come in Time Battery

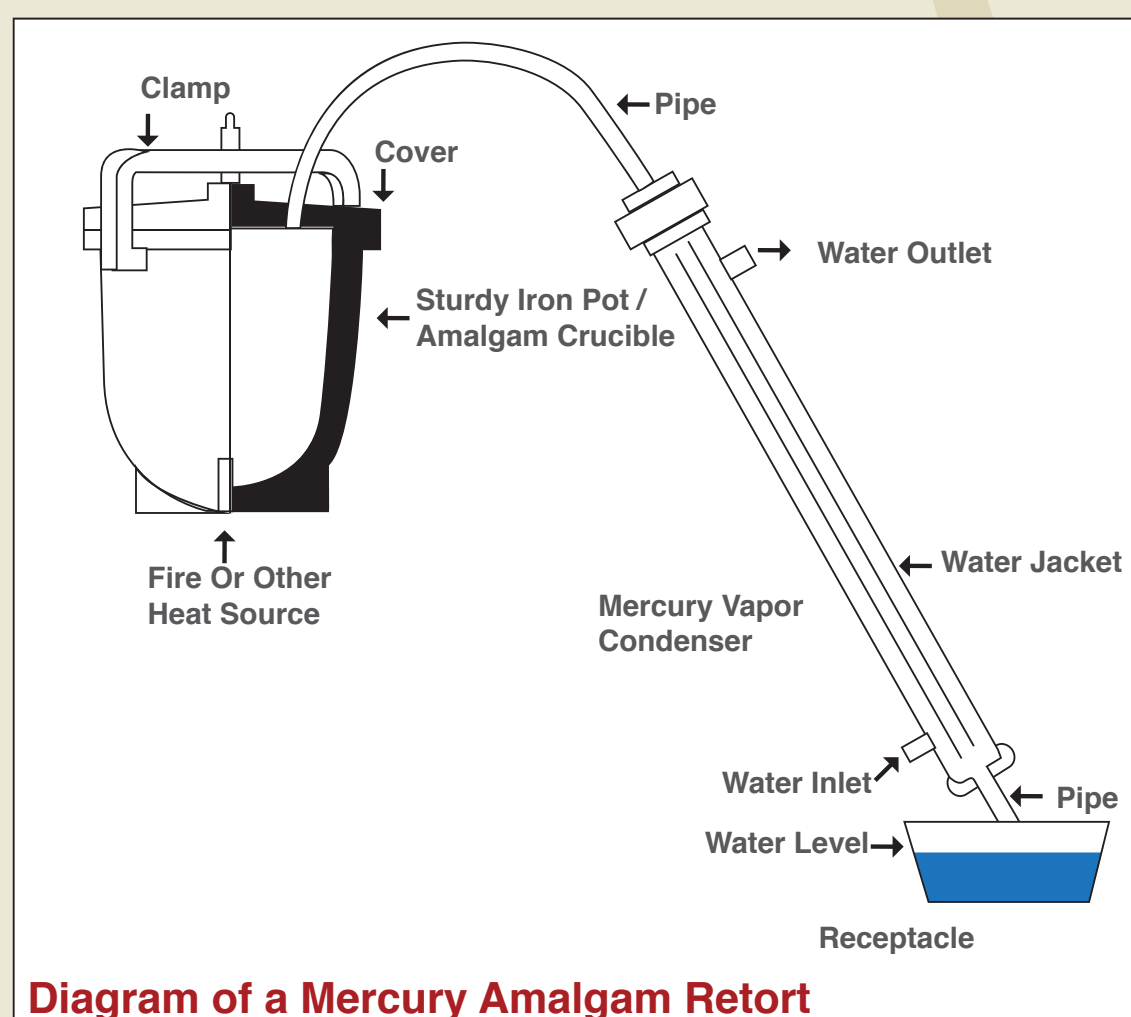
Noisy... Wet... Dusty... Hot... Cold... Dangerous

How the Come in Time Battery worked



Standing at this very spot, try to imagine you are inside a large wooden frame shed sheathed in corrugated iron. Bone chilling in winter. A sweat box over summer. And always, the noise – the continuous cacophony of heavy metal pulverizing the quartz rock (ore) to release the gold.

Ore is carried to the Come in Time Battery by small tramway wagons, or iron buckets on the aerial cableway, and tipped into the **Rock Breaker (A)**, also called a Jaw Crusher, which breaks it down into fragments no bigger than 50mm in diameter. The fragments drop into the **Ore Bin (B)** and then down the **Ore Chute (C)** to the **Ore Feeder (D)**.



From the **Ore Feeder**, measured amounts of ore fragments are fed into the **Mortar Box (E)**.

To release gold imbedded in the quartz, heavy **Stamps** pulverise the ore fragments into a fine slurry with water. The slurry then passes through a fine mesh screen and over mercury-coated **Copper Tables (F)**. Gold coming in contact with mercury forms an amalgam, similar to silver and mercury amalgam used for tooth fillings.

While some amalgam particles remain on the **Copper Tables (F)**, others flow off the end into the **Mercury Trap (G)**. The amalgam is collected and placed in a heavy round pot-like **Retort (J)** where it is heated to vaporize the mercury away from the gold. The vapour passes through a long spout where cool air or a cold water jacket

condenses it back into mercury which drops into cold water for collection and re-use. When the Retort cools it is opened and the gold is removed.

A **Berdan Pan (I)** is used to further grind down the slurry and works like a mortar and pestle, except that the pestle is stationary, this being a large heavy loaf-shaped slug of steel, with the mortar (pan) rotated against the slug.

The Battery machinery

(1) **Mortar Box and Dies** (also called Bibles). Each metal Die is positioned in the bottom of the Mortar Box beneath a heavy metal Stamper Head.

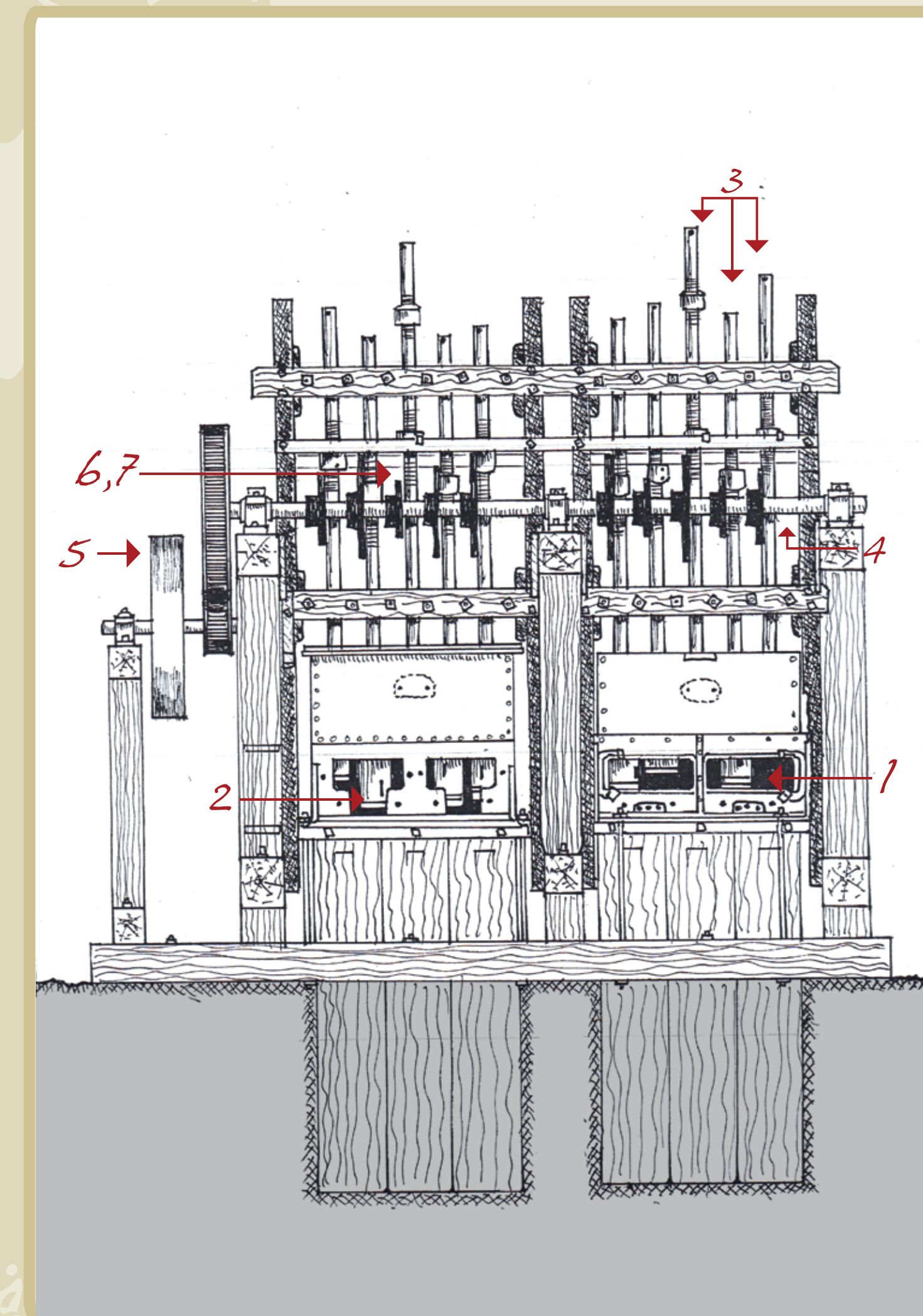
(2) **Stamper Head**. As each Stamper Head smashes down onto its Die, ore fragments caught in between Head and Die are crushed, releasing any gold that was imbedded in the ore.

(3) **Stamper Stems**. Strong metal rods to which the Stamper Heads are attached.

(4) **Camshaft and (5) Drive Wheel**. The Camshaft is driven by a Drive Wheel connected by a continuous belt to a Pelton Wheel (H) powered by the high pressure jet of water.

(6) **Tappets and (7) Cams**. The Tappet is a metal yoke secured to each Stamper Stem. As the Camshaft rotates, each Cam strikes the underside of its Tappet, raising the Stamper Stem and thereby lifting the Stamper Head

from its Die. To aid uniform pulverising of ore and even mixing of the slurry, each Stamper Stem is lifted in sequence. For a 5-Stem stamper this is usually 3-1-4-2-5. The "S"-shaped Cam is designed so that the Stamper Head is gradually lifted away from its Die before being suddenly released to smash down heavily. Friction between the Tappet and Cam rotates the Stamper Stem to prevent uneven wear on the ore pulverizing surfaces.



For more information visit www.goldfieldstrust.org.nz

