

3.12 Sweney's orifice

After the Adams Vortex blast orifice, the Sweney nozzle^{20,21}, see Appendix A.11, was another successful attempt to subdivide the single jet from the orifice into separate jets, eight in total. Figure 3.9 shows the configuration. The normal circular orifice was replaced by a cap with eight slotted nozzles, carefully streamlined on the inside. Between the slots the gases could freely flow towards, and into, the jets.

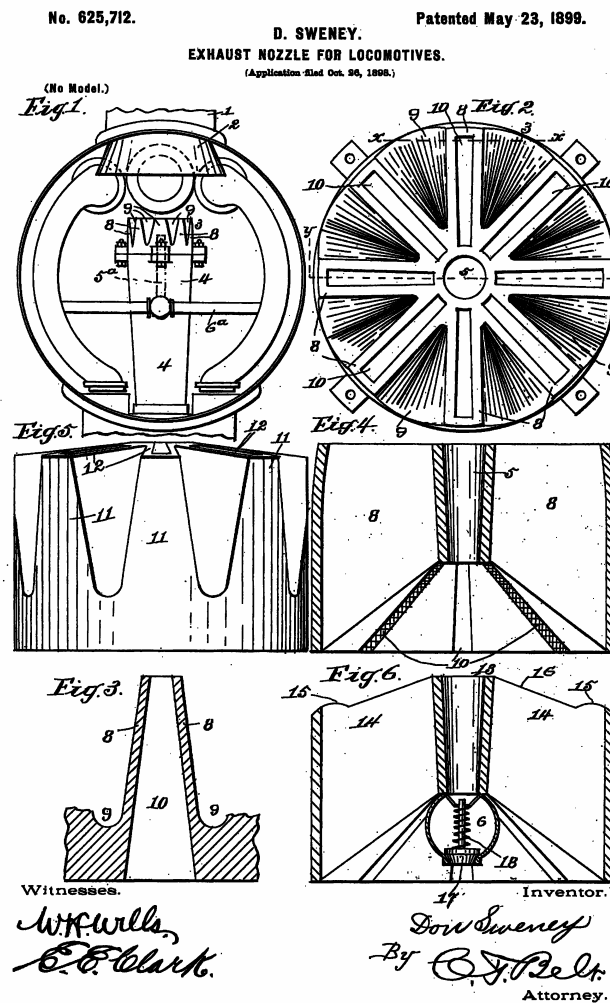


Figure 3.9 Sweney Patent drawing²⁰

Sweney showed that he could reduce the backpressure by some 50% with his orifice²¹. With 6.5 lbs/sq.in. he was able to produce a vacuum of 9 inches of water, other orifices were only able to arrive at 4 to 5.5 in. of water. However, these figures do not surpass the Clark's ratio of one in. of mercury backpressure for one in. of water vacuum.

It is a pity that Sweney's orifice did not get sufficient attention as it found limited acceptance. However, it was the very first of a family of this type of nozzles, mainly used in the U.S.A., as well as in Australia and New Zealand, on the American-style locomotives used there.