



From the USPTO

examination report:

"The examiner disagrees that there is a difference between a "pulling rod engine" and a

conventional engine in the dwell time piston at top dead center if the connecting rod and crankshaft arms are the same length.

This is a trigonometric certainty. "

In the above 18 slides (one per 20 crankshaft degrees) the connecting rod (160mm) and the crankshaft arms (50mm) are the same for a "pulling rod" and a conventional engine. Each slide shows: by continuous black line the cylinder and the cylinder head; by green line the crankshaft arm and the crankpin; by cyan line the connecting rod of the "pulling rod engine"; by blue line the wrist pin and the left side of the piston of the "pulling rod engine"; by magenta line the connecting rod of the conventional engine; by red line the wrist pin and the right side of the piston of the conventional engine.

The difference between the "pulling rod engine" and the conventional engine in the dwell time piston at top dead center is more than obvious. **If the "trigonometric certainty" of the USPTO primary examiner is right / true, the above are an illusion / trick.**

Relative to its top position (0 crankshaft degrees, top left slide):
at 20 crankshaft degrees (2nd slide) the piston of the conventional is displaced (moved) by 3.93mm while the piston of the "pulling rod engine" is displaced by only 2.1mm (3.93/2.1=1.81), i.e. in the -20 to +20 crankshaft degrees interval around the TDC (wherein the most important combustion processes take place) the conventional piston moves with almost double speed as compared to the "pulling rod engine" piston, i.e. the "pulling rod engine" piston dwells longer at TDC;
at 40 crankshaft degrees (3rd slide) the piston of the conventional is displaced by 14.96mm while the piston of the "pulling rod engine" is displaced by only 8.44mm (14.96/8.44=1.77);
at 60 crankshaft degrees (4th slide) the piston of the conventional is displaced by 30.97mm while the piston of the "pulling rod engine" is displaced by only 19.03mm (30.97/19.03=1.63). And so on.