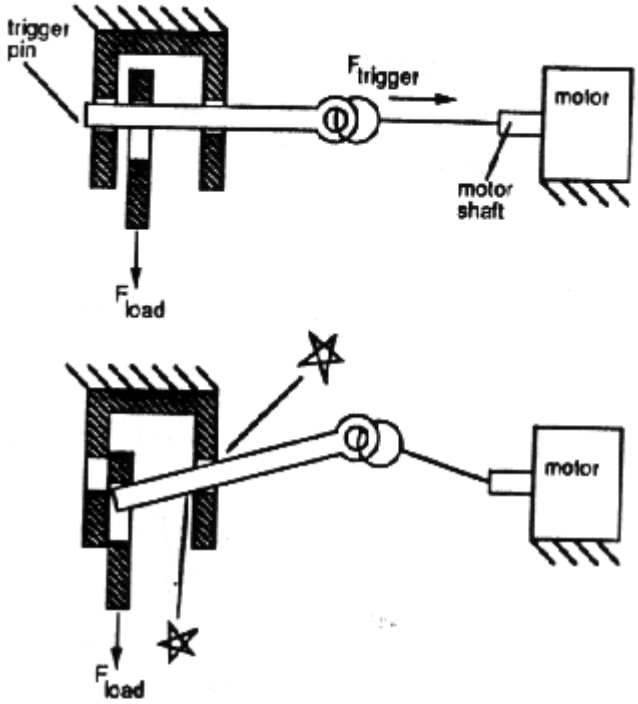
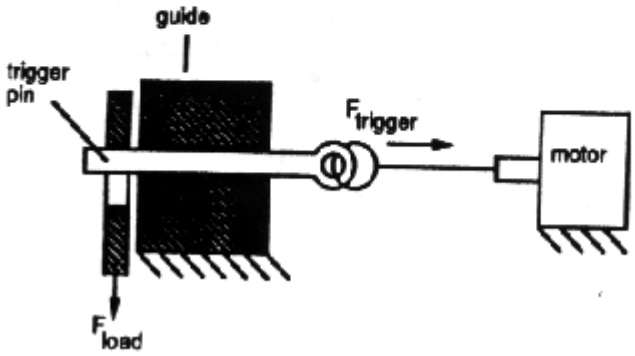
2.007 Cookbook: Triggers

Trigger that jams: (i.e., gets stuck; i.e., fails)

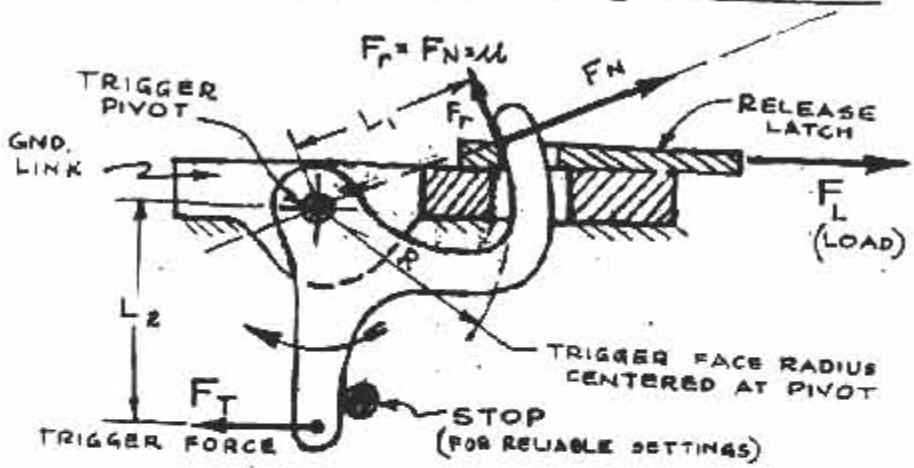


Trigger that doesn't:



E.E. BLANCO

- NEUTRAL PIVOTED TRIGGER -

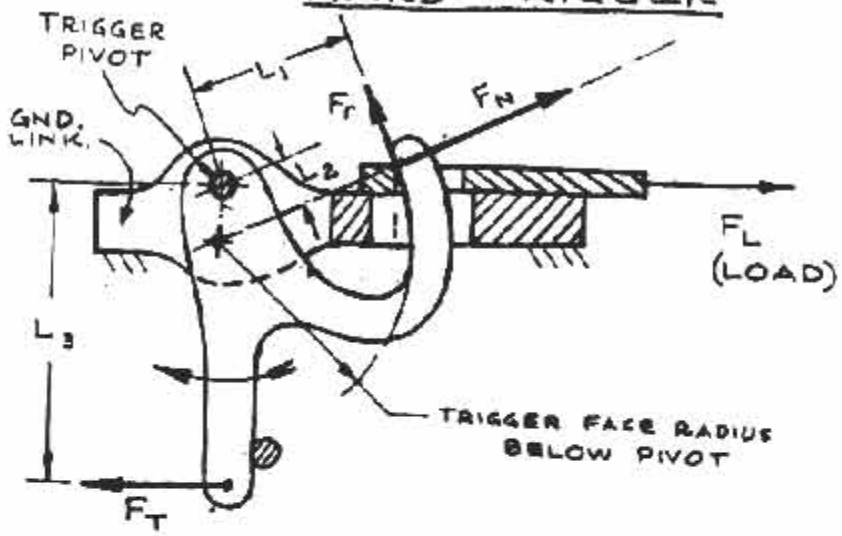


SHOOTS WHEN $F_T > \frac{F_F \times L_1}{L_2}$ μ = STATIC COEFF. OF FRICTION

NOTE - The trigger force F_T may result from the pull from a string attached to the shaft of a small motor, or from any other convenient mechanical action at a desired time, i.e. striking something.

E. E. BLANCO

-HARD TRIGGER-



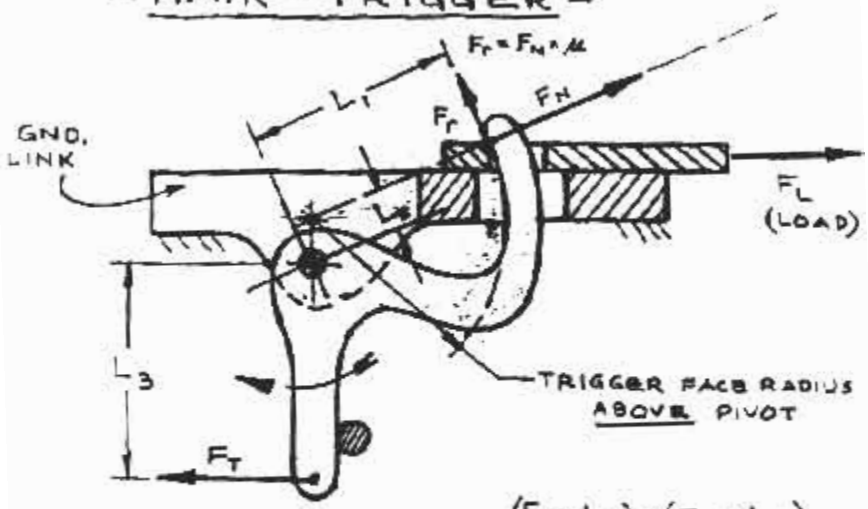
SHOOTS WHEN $F_T > \dfrac{(F_r \times L_1) + (F_N \times L_2)}{L_3}$

NOTE - This is probably the safest trigger system, but the one that demands the highest trigger force F_T.

* A mere shift up or down in the effective pivot axis can tune a trigger into the desired mode or performance suitable to a given coefficient of friction.

E. BLANCO

– HAIR – TRIGGER –

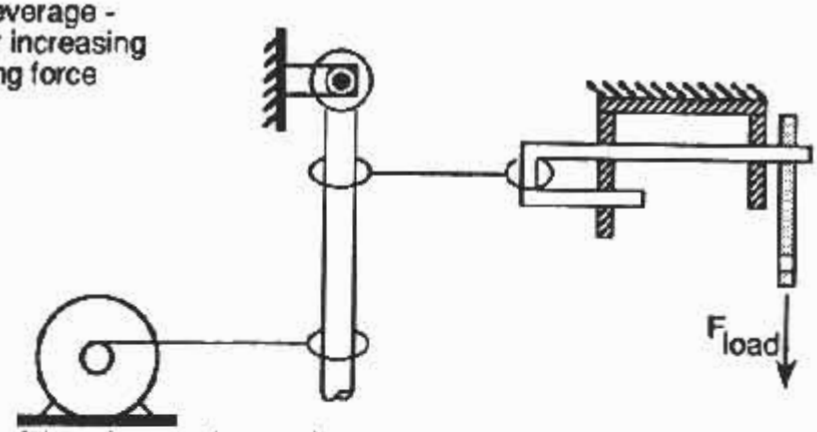


SHOOTS WHEN $F_T > \dfrac{(F_r \times L_1) - (F_N \times L_2)}{L_3}$

NOTE - The magnitude of L_2 controls the sensitivity. The system becomes metastable as $F_r \times L_1 \approx F_N \times L_2$

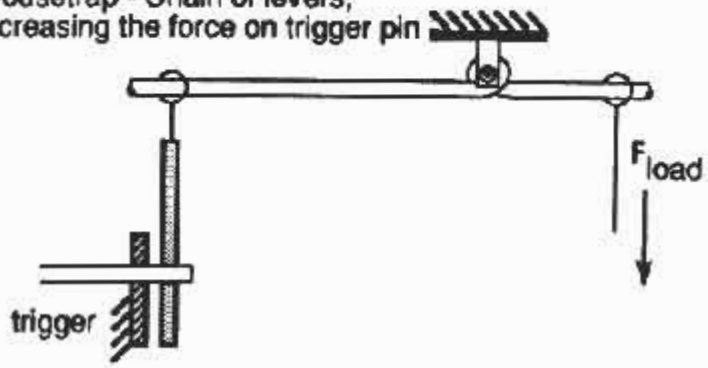
Ways to trigger a large force with a small one

1) Leverage -
lever increasing
pulling force



motor (above) can twist a string
or wind a string....etc.

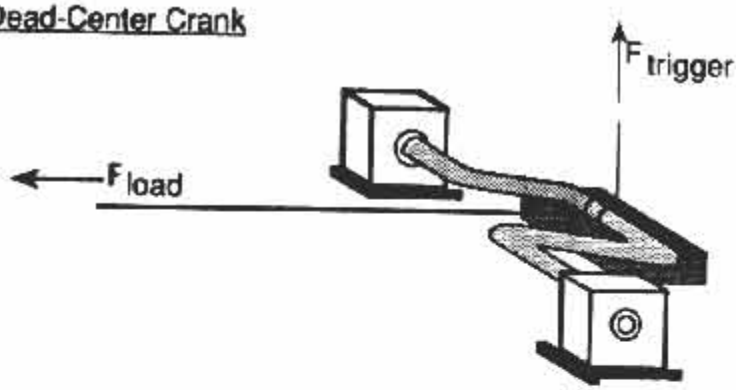
2) Mousetrap - Chain of levers,
decreasing the force on trigger pin



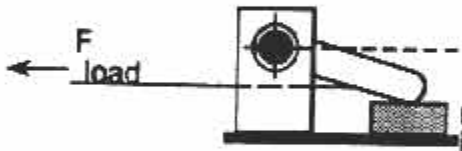
Helen Shaughnessy

Original sketches courtesy of
Crispin Miller

Over-Dead-Center Crank



Section:



rest, to support crank just below dead-center position

(when crank is lifted through dead center, it flips on around, no longer resisting load)

OR