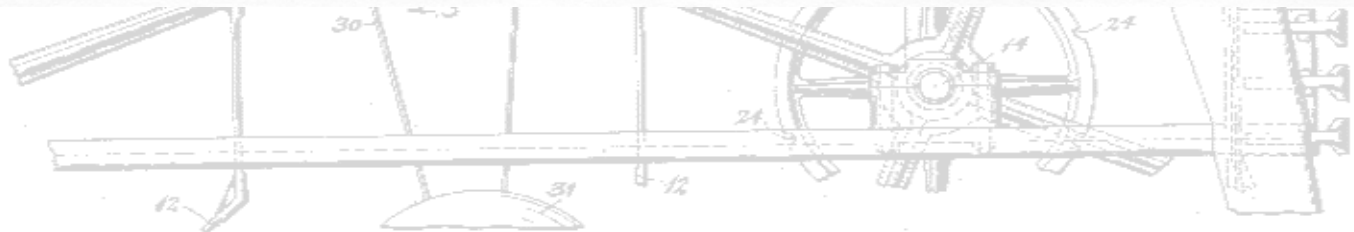
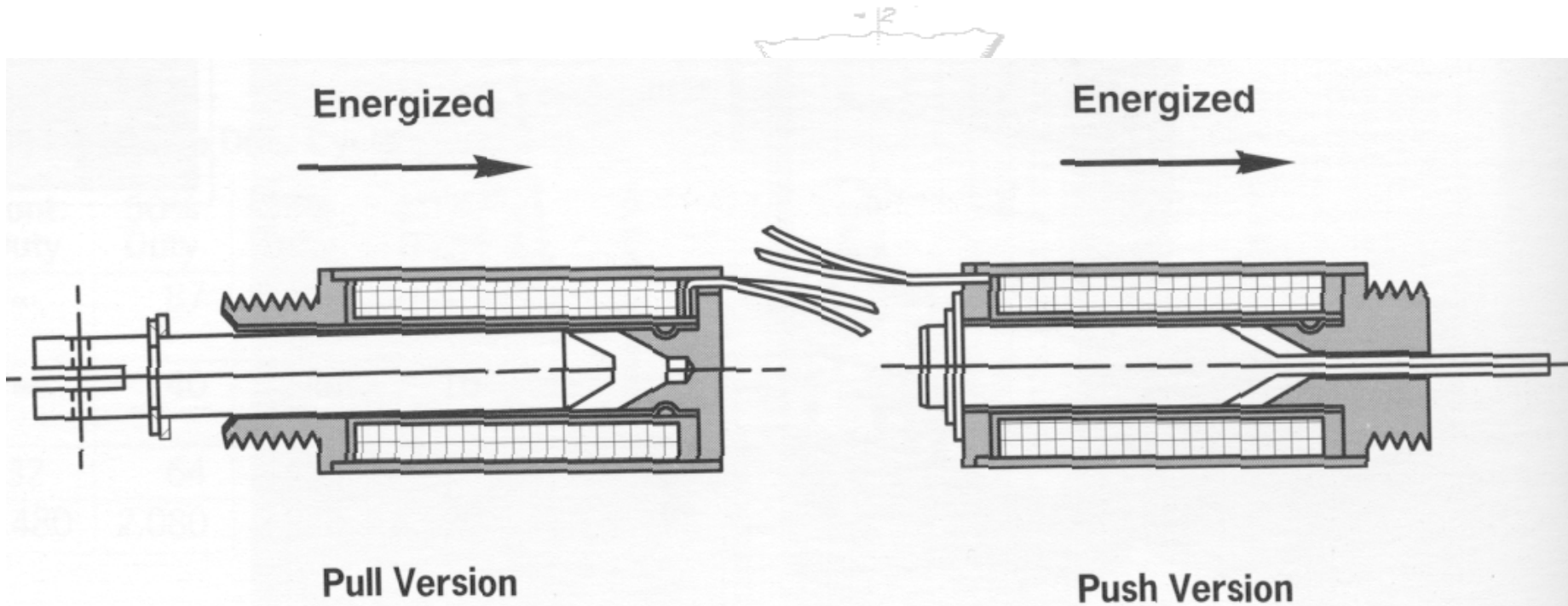
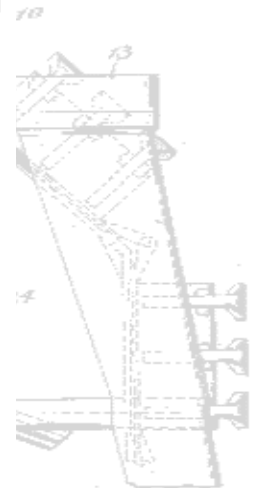
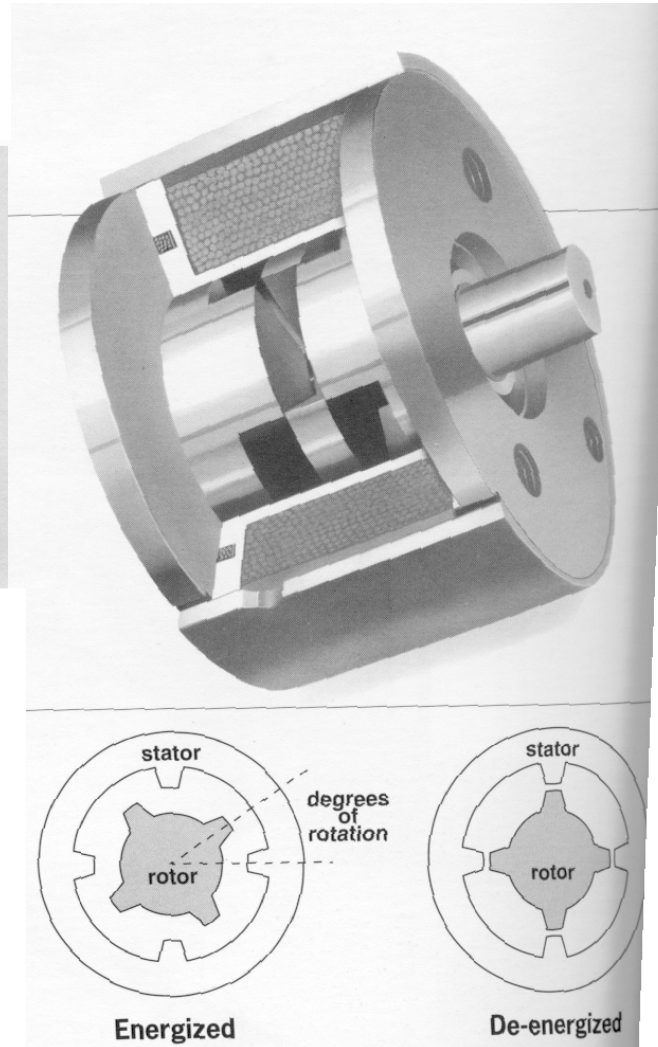
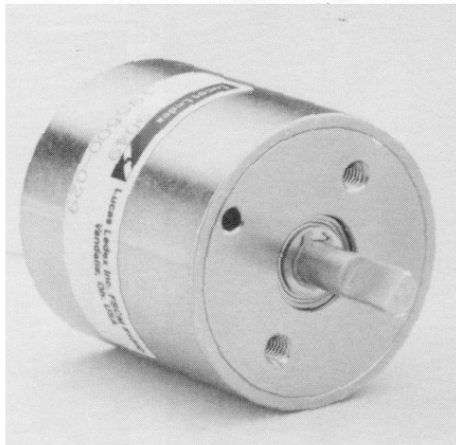


ELECTRIC SOLENOIDS

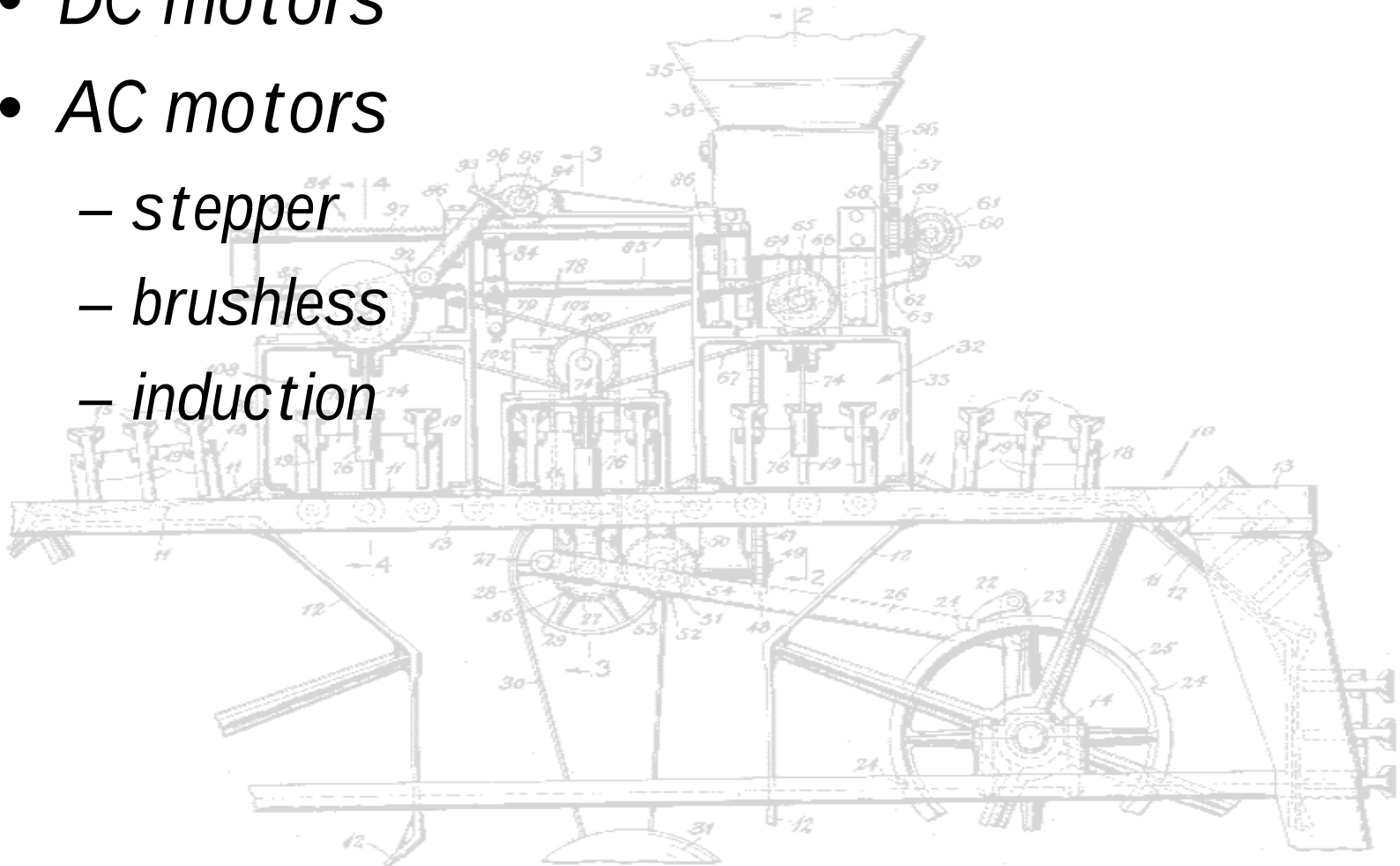


ELECTRIC ROTARY ACTUATOR - BTA



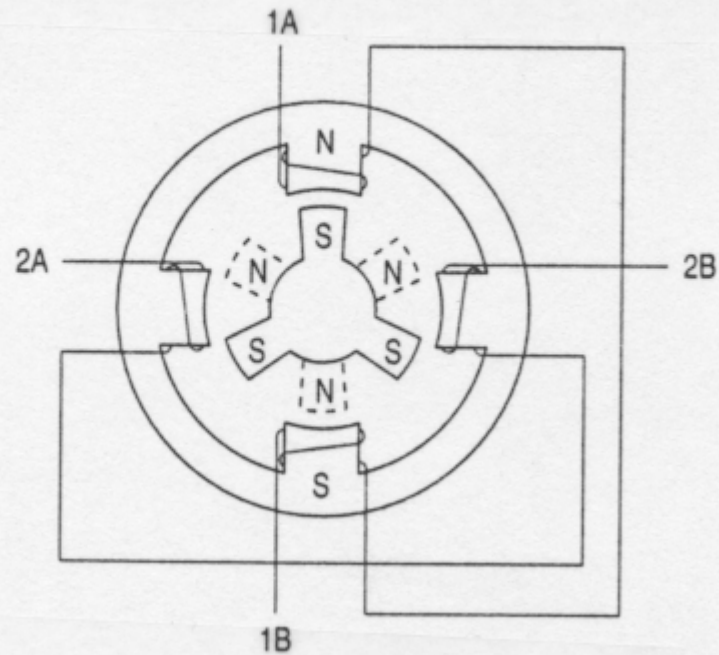
ELECTRIC ROTARY ACTUATORS

- *DC motors*
- *AC motors*
 - *stepper*
 - *brushless*
 - *induction*



STEPPER MOTORS

Fig. 1.4 Simple 12 step/rev hybrid motor



STEPPER MOTORS

Fig. 1.5 Full stepping, one phase on

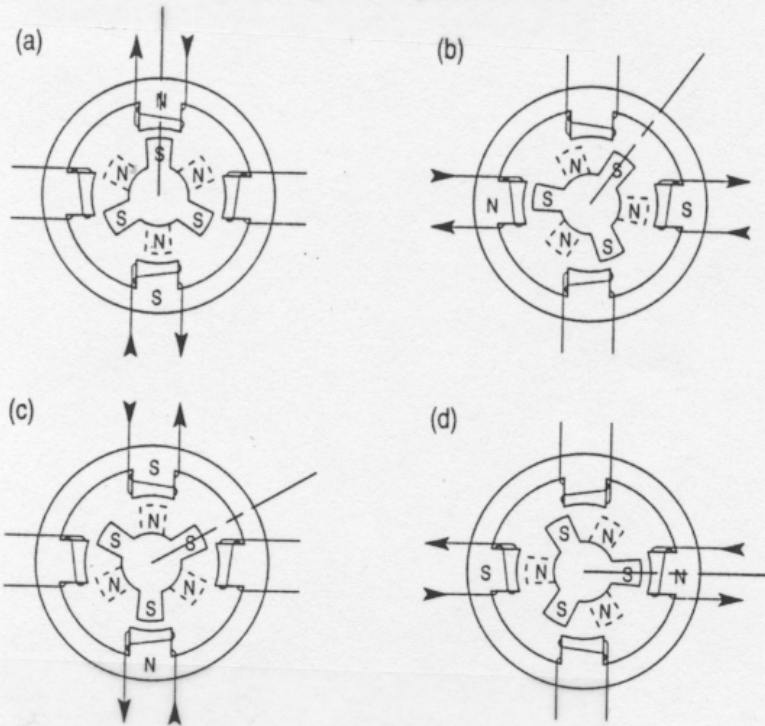
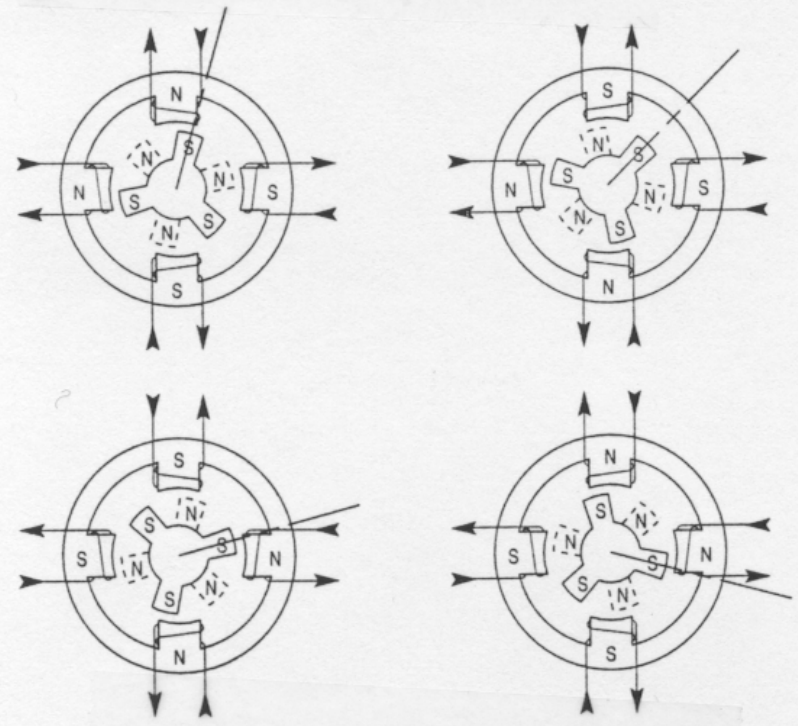


Fig. 1.6 Full stepping, two phase on



STEPPER MOTORS

Fig. 1.8 Full step current, 2-phase on

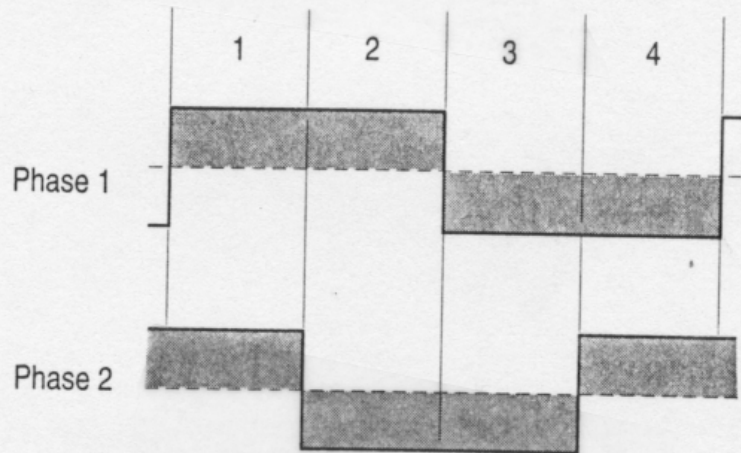
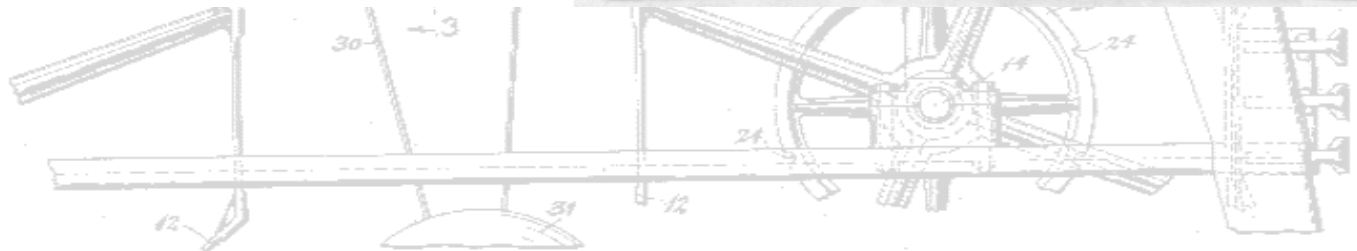
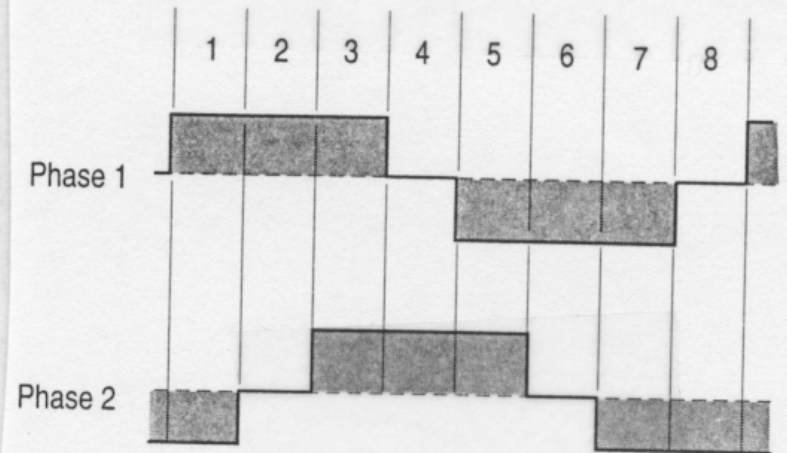
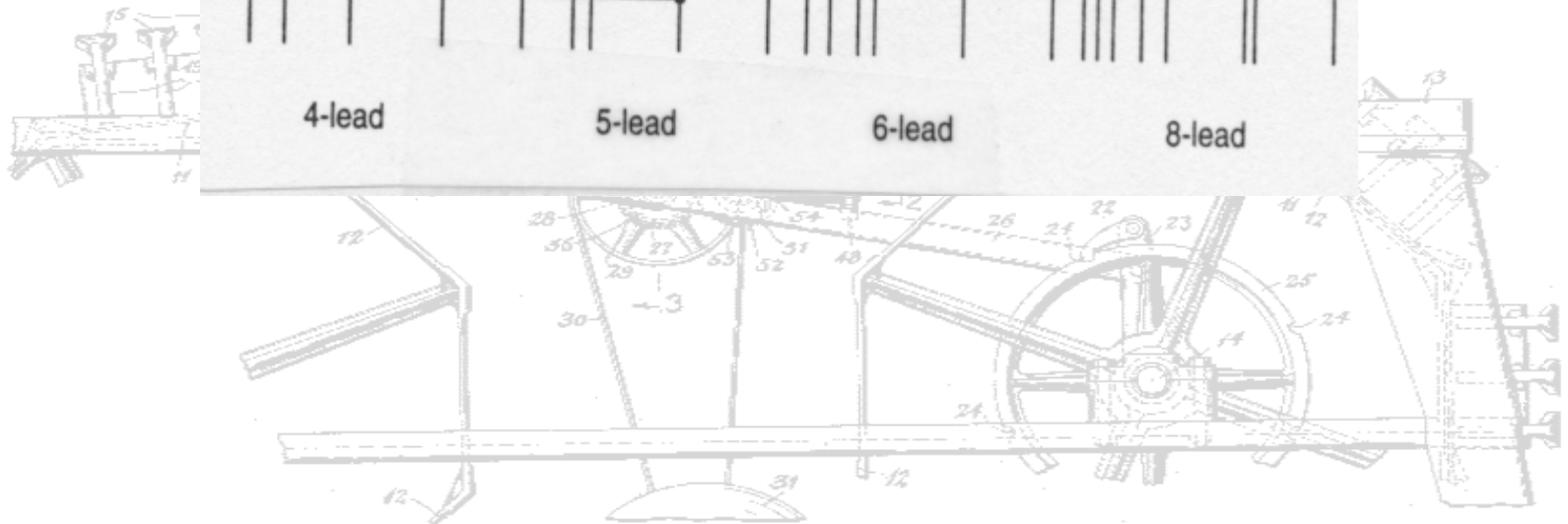
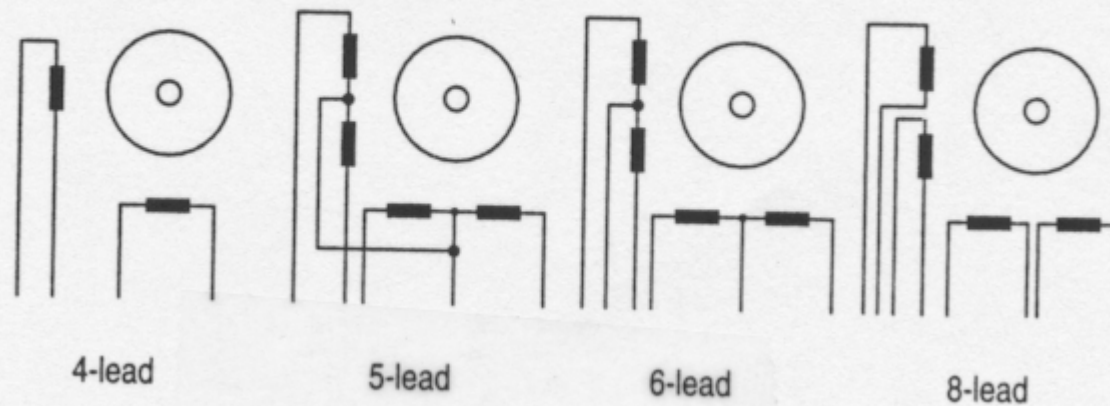


Fig. 1.9 Half step current



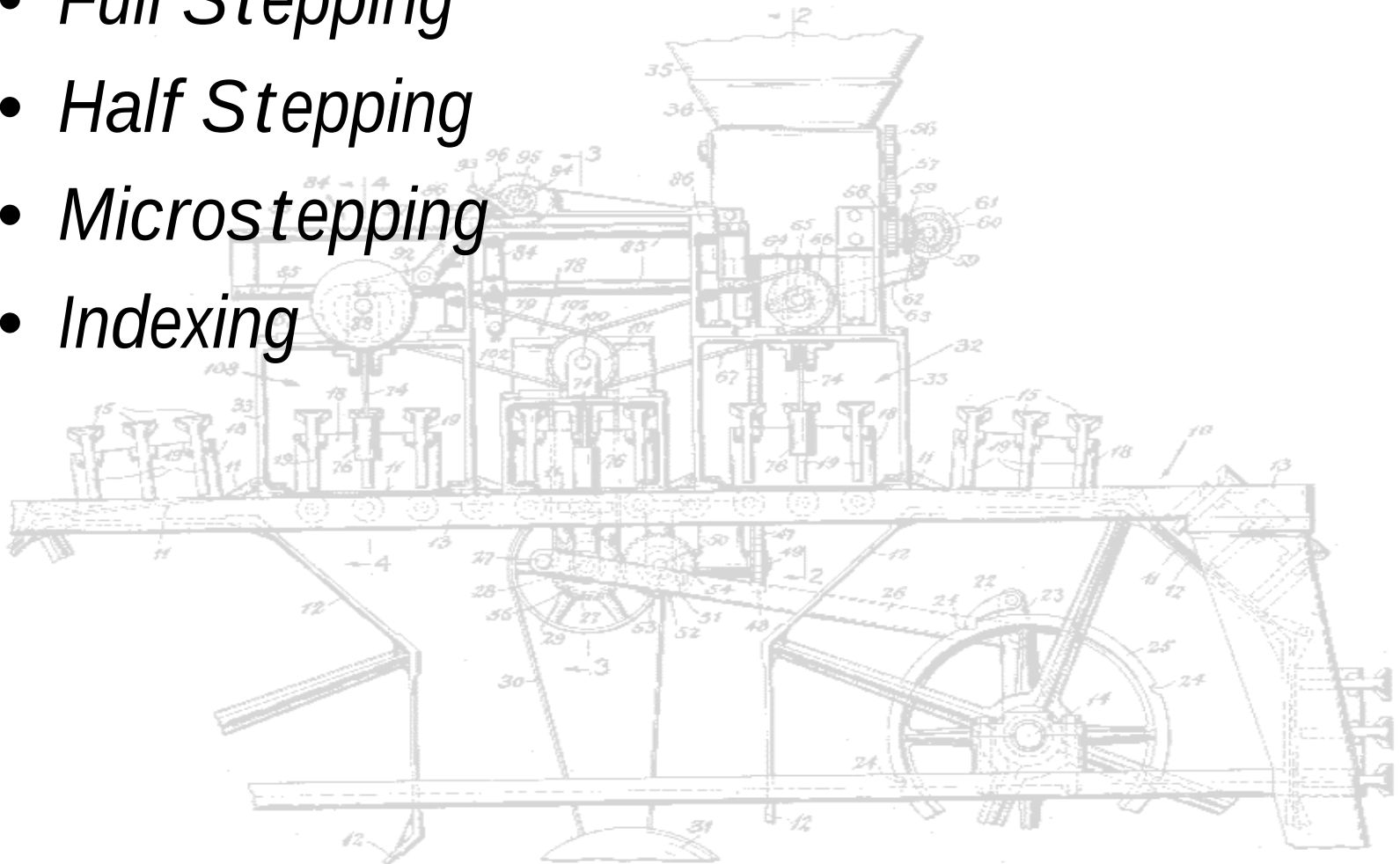
STEPPER MOTORS

Fig. 1.13 Motor lead configurations



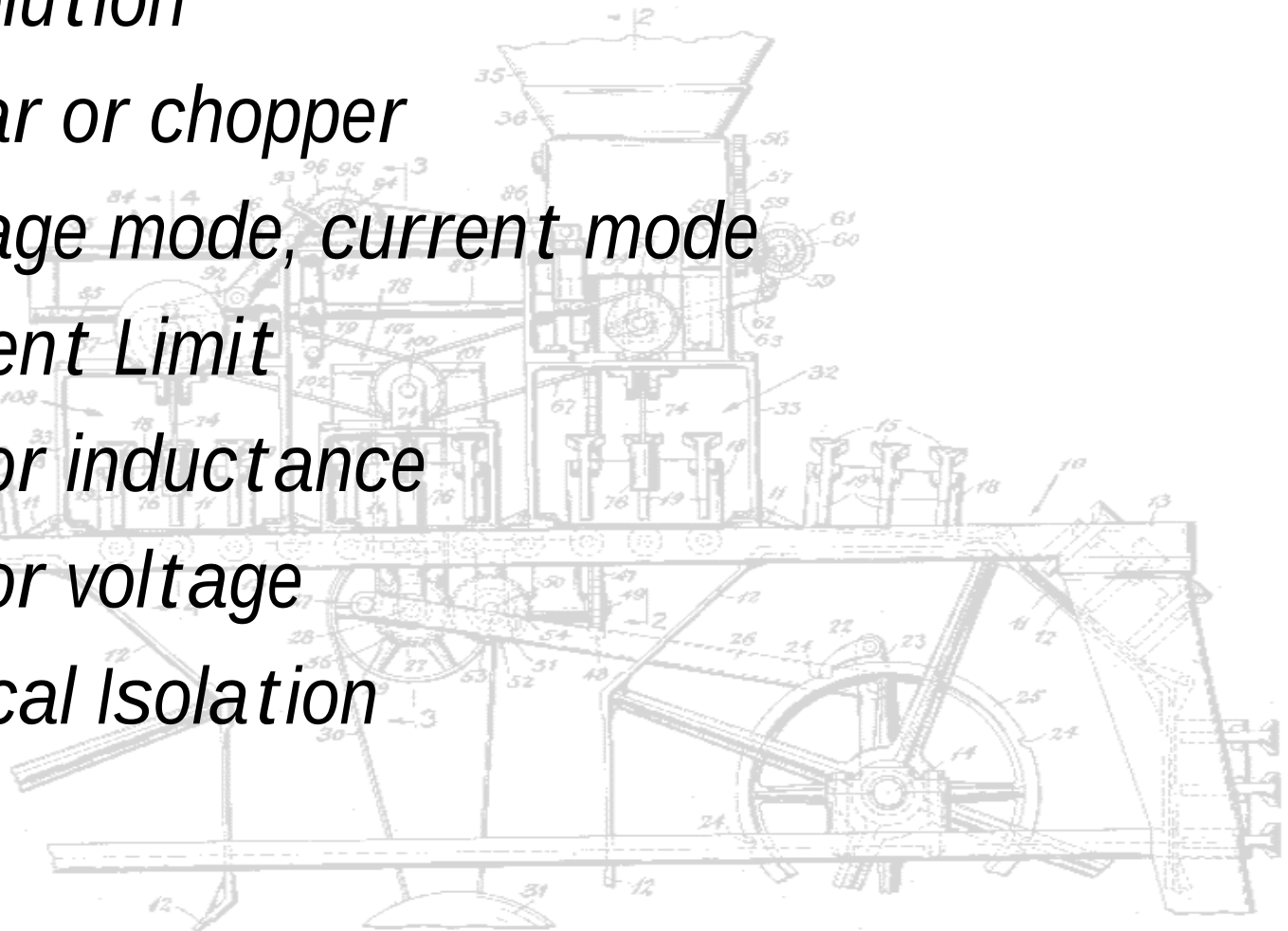
STEPPER MOTOR DRIVES

- *Full Stepping*
- *Half Stepping*
- *Microstepping*
- *Indexing*



DRIVE PARAMETERS

- *Resolution*
- *Linear or chopper*
- *Voltage mode, current mode*
- *Current Limit*
- *Motor inductance*
- *Motor voltage*
- *Optical Isolation*

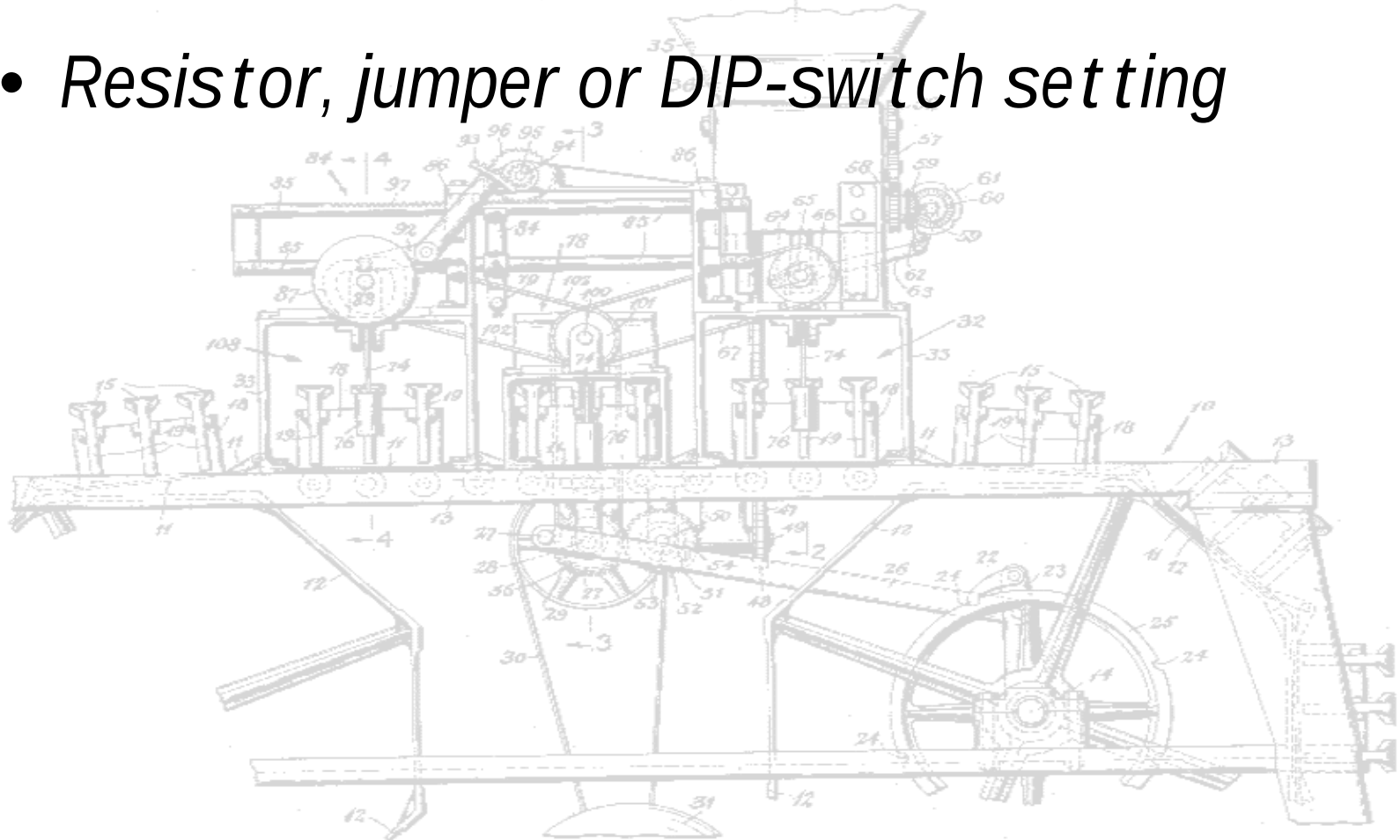


RESOLUTION

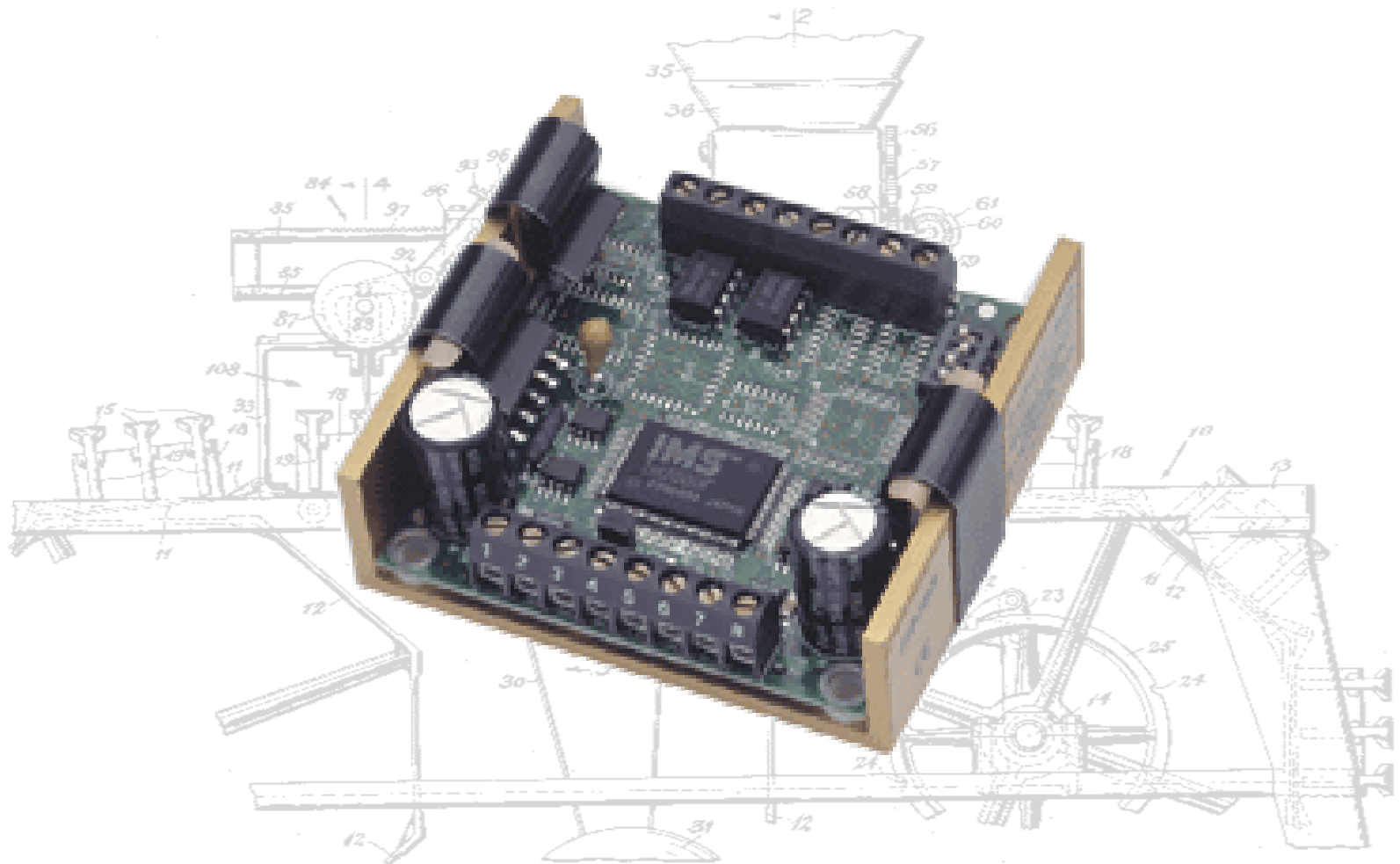
- *Full step/Half step*
- *Microstepping*
 - *x2,x4,x5,x8,x10,x16,x25,x32,x50,x64,x125,x128,x250,x256 common choices*
- *Max step frequency*
 - *10MHz max frequency => 12KRPM for 1.8° motor at x256*
 - *7kHz pulse rate from PLC => 8.2RPM (at x256), 2.1KRPM (at x1)*

CURRENT LIMIT

- *Must not exceed rated motor current*
- *Resistor, jumper or DIP-switch setting*

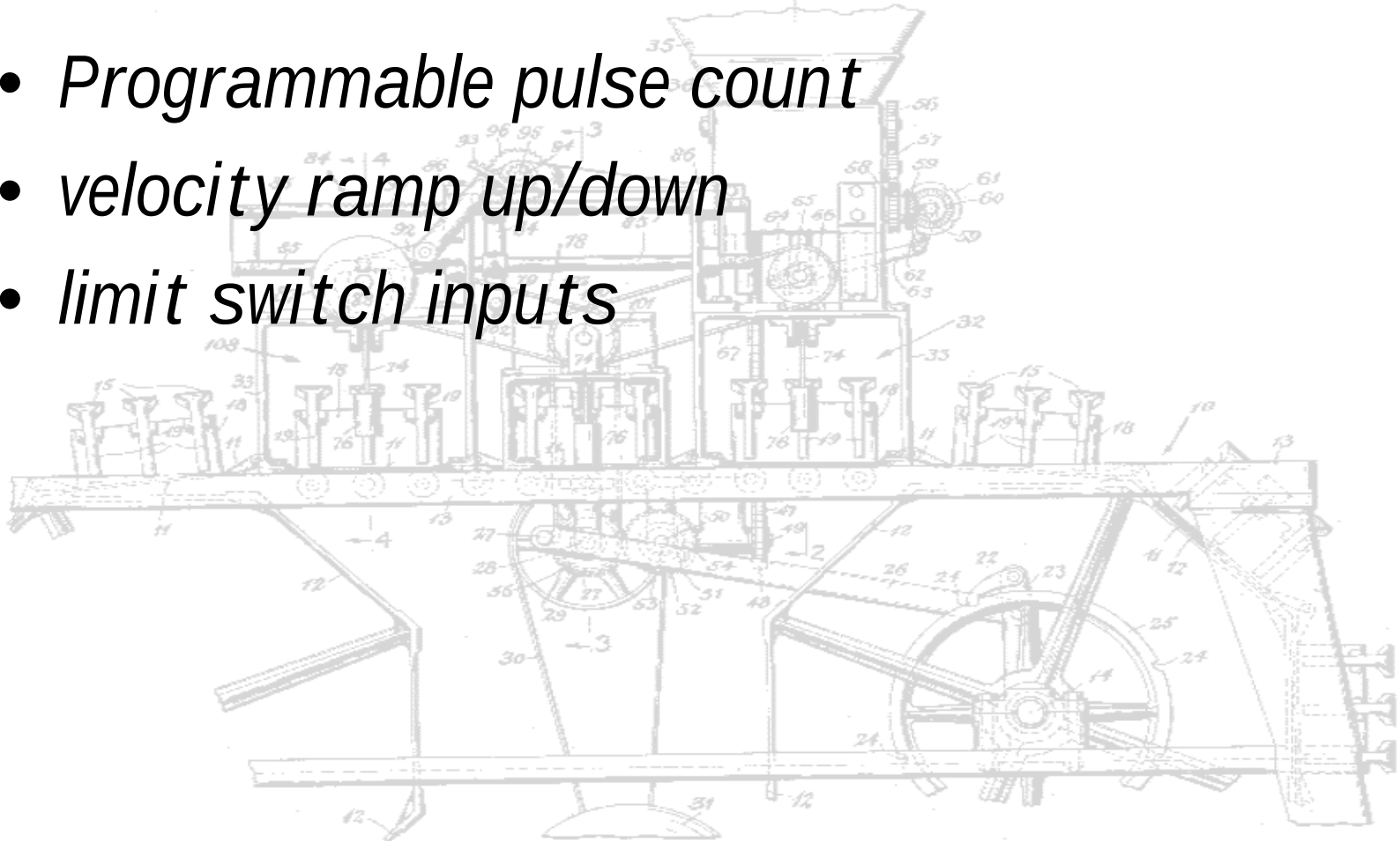


MICROSTEP DRIVE - IM483



INDEXER

- *Limited version of a controller*
- *Programmable pulse count*
- *velocity ramp up/down*
- *limit switch inputs*



POWER SUPPLY

- *Regulated/Unregulated*
- *Linear/Switching*
- *Overcurrent*
- *Overvoltage*
- *Regeneration*

