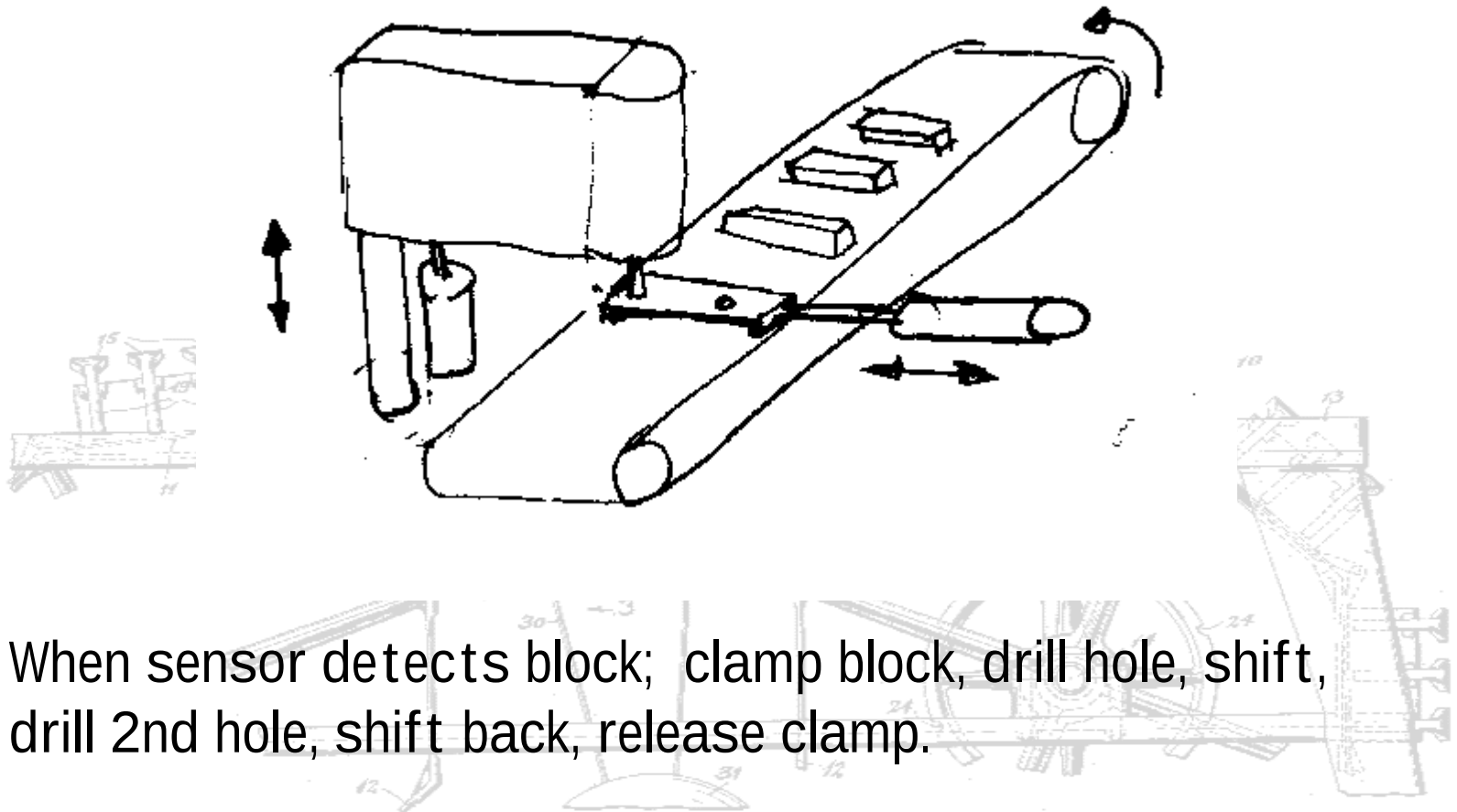


FIGURING OUT STATE TRANSITIONS

iSENSOR	iRET	iEXT	oCYL(curr)	oCYL (next)	
0	0	0	0	0	
0	0	0	1	1	
0	0	1	0	0	
0	0	1	1	0	State 0->1:
0	1	0	0	0	iSENSOR•/iEXT
0	1	0	1	0	
0	1	1	0	0	
0	1	1	1	0	State 1->0:
1	0	0	0	1	iEXT +
1	0	0	1	1	/iSENSOR•iRET
1	0	1	0	0	
1	0	1	1	0	
1	1	0	0	1	
1	1	0	1	1	
1	1	1	0	0	
1	1	1	1	0	

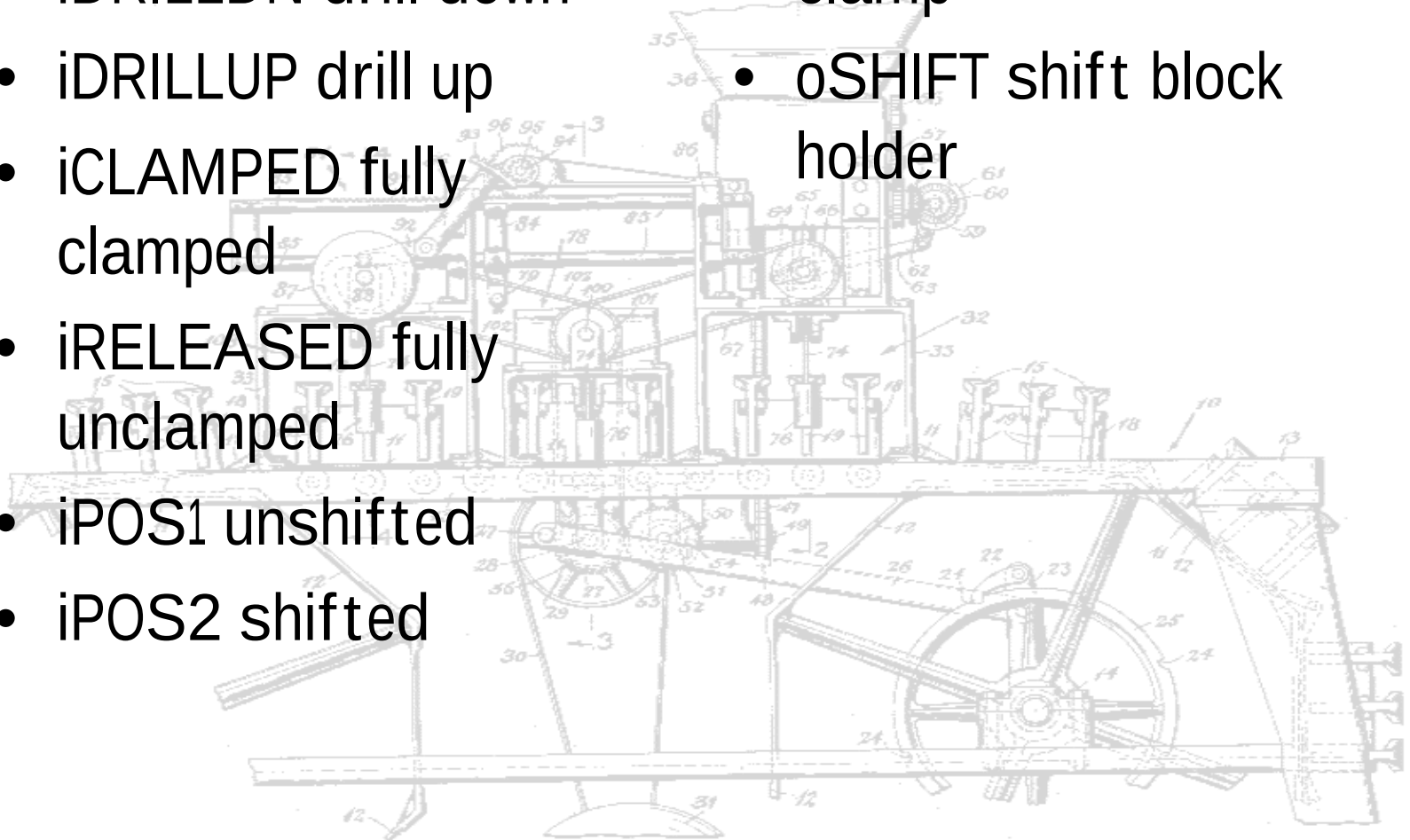
MULTI-STATE EXAMPLE



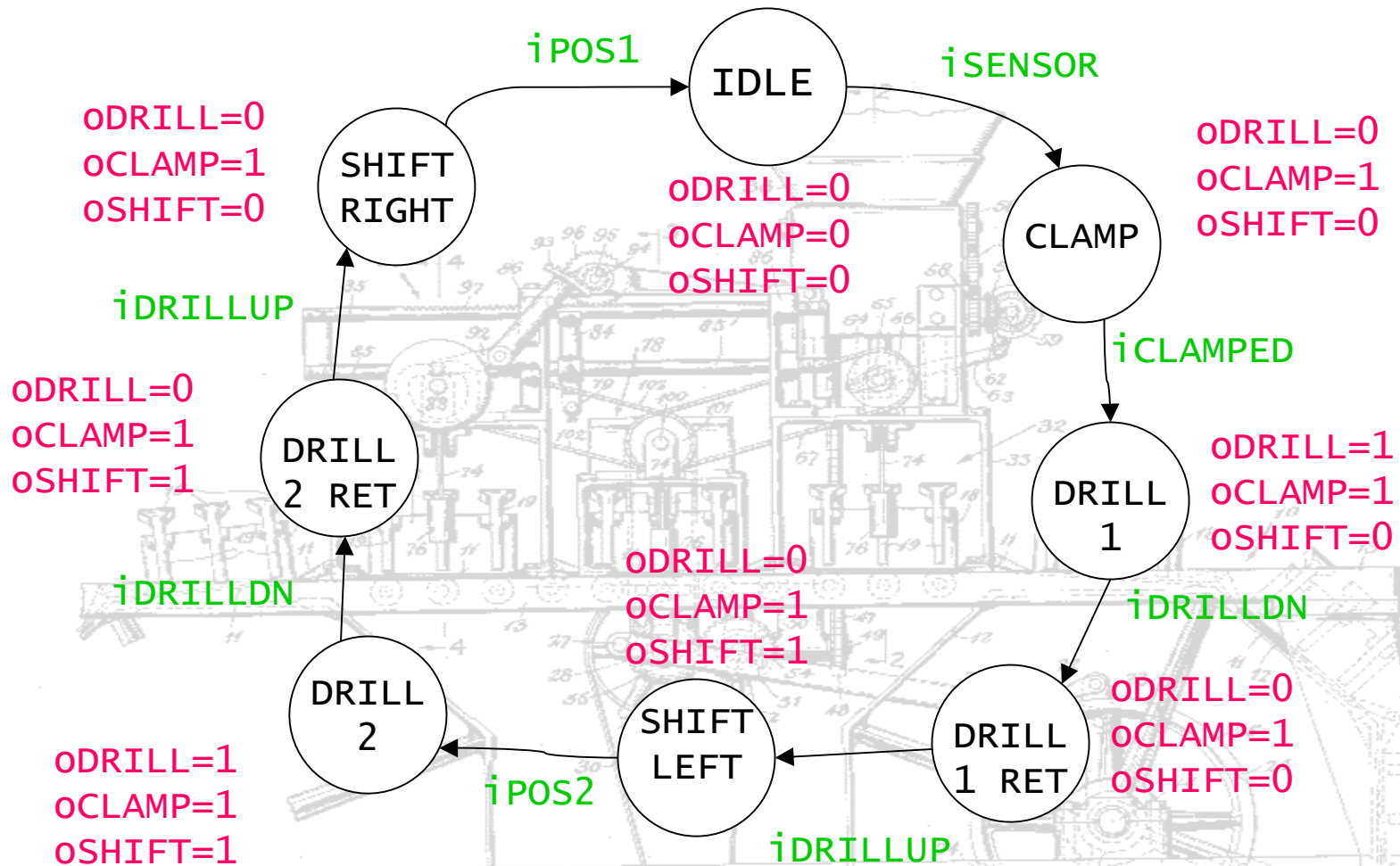
When sensor detects block; clamp block, drill hole, shift, drill 2nd hole, shift back, release clamp.

INPUTS & OUTPUTS

- iSENSOR block present
- iDRILLDN drill down
- iDRILLUP drill up
- iCLAMPED fully clamped
- iRELEASED fully unclamped
- iPOS1 unshifted
- iPOS2 shifted
- oDRILL start drilling
- oCLAMP activate clamp
- oSHIFT shift block holder



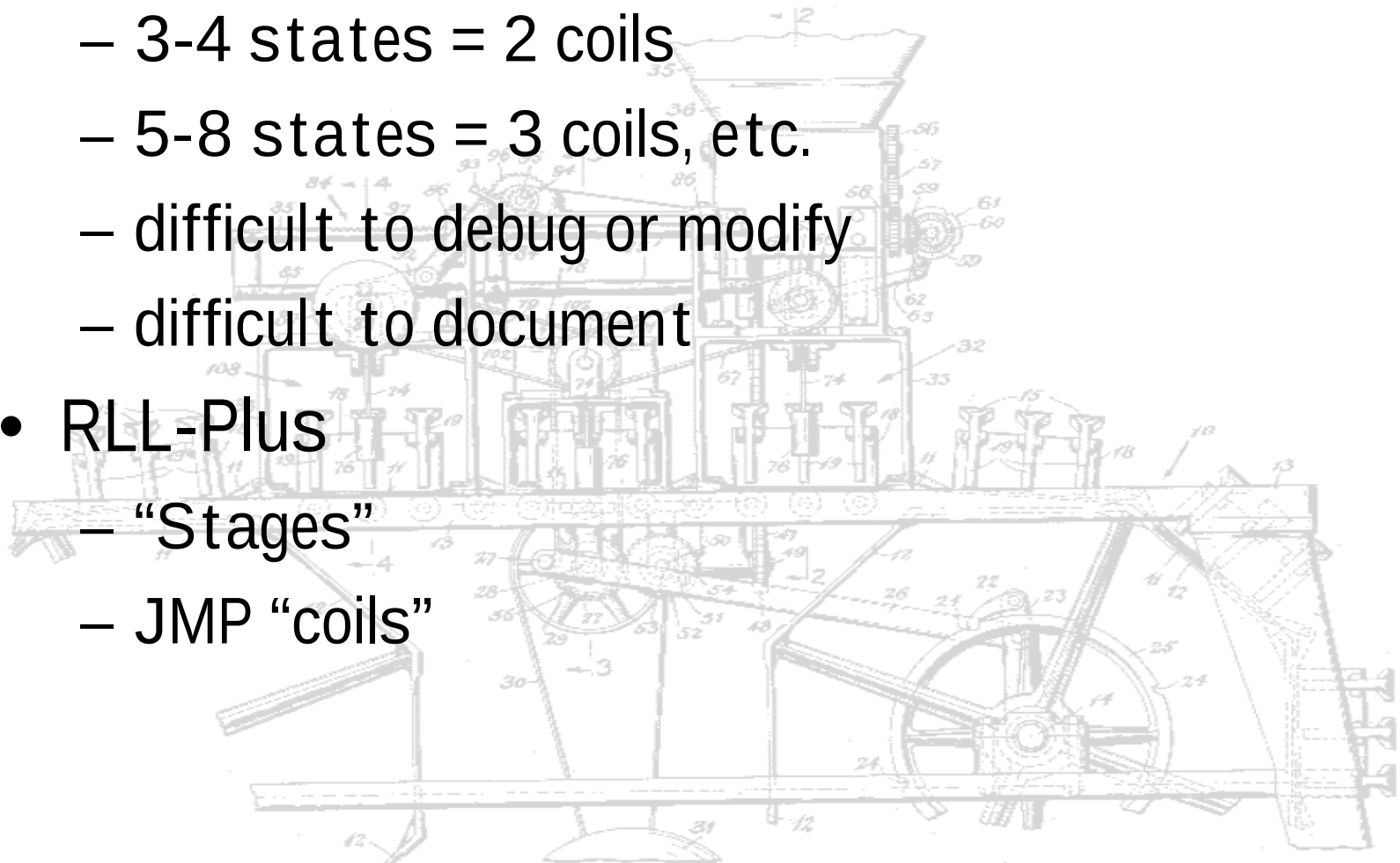
STATE DIAGRAM



STATE MACHINES IN LADDER LOGIC

- Pure relay logic:
 - 2 states = 1 coil
 - 3-4 states = 2 coils
 - 5-8 states = 3 coils, etc.
 - difficult to debug or modify
 - difficult to document

- RLL-Plus
 - “Stages”
 - JMP “coils”



STAGE LADDER LOGIC

