



[54] POWER WINDOW OR PANEL CONTROLLER

4,980,618 12/1990 Milnes et al. 318/286
5,204,592 4/1993 Huger 318/286

[75] Inventors: John Washeski, Reed City; Mark R. Wheeler, Cadillac; Mario Boisvert, Reed City, all of Mich.

OTHER PUBLICATIONS

NHTSA Notice, Federal Motor Vehicle Safety Standards, Federal Register, Apr. 16, 1991.

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[22] Filed: Apr. 22, 1992

[51] Int. Cl.⁵ G05D 3/20; H02H 7/085

[52] U.S. Cl. 307/10.1; 318/469; 49/26

[58] Field of Search 318/280-286, 318/456, 458, 453; 49/26, 138; 307/9.1, 10.1; 296/216, 223

[57] ABSTRACT

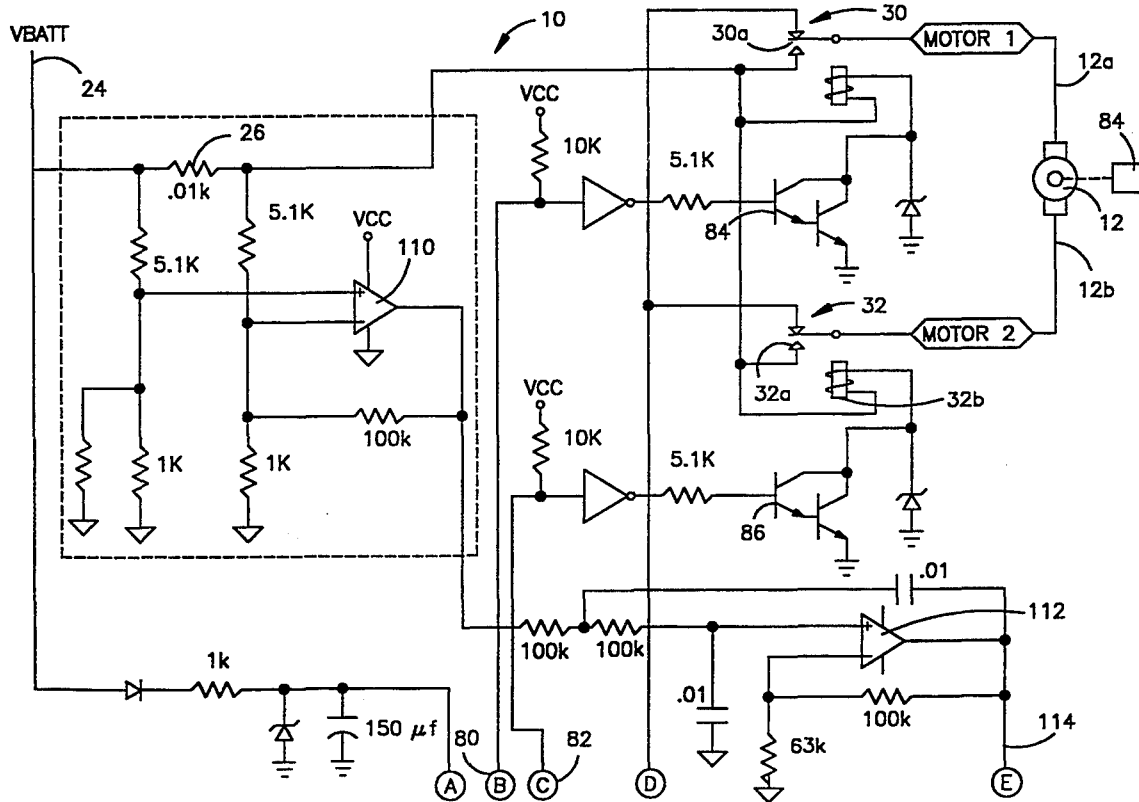
A controller for energizing a power window or panel such as a power sunroof. The disclosed controller senses both hard and soft obstructions and deactivates a motor that moves the sunroof when an obstruction is detected. The controller also senses obstructions during start-up of the motor and regulates the speed of the window or panel by pulse width modulating motor energization signals.

[56] References Cited

U.S. PATENT DOCUMENTS

4,686,598 8/1987 Herr 318/286
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12 Claims, 5 Drawing Sheets



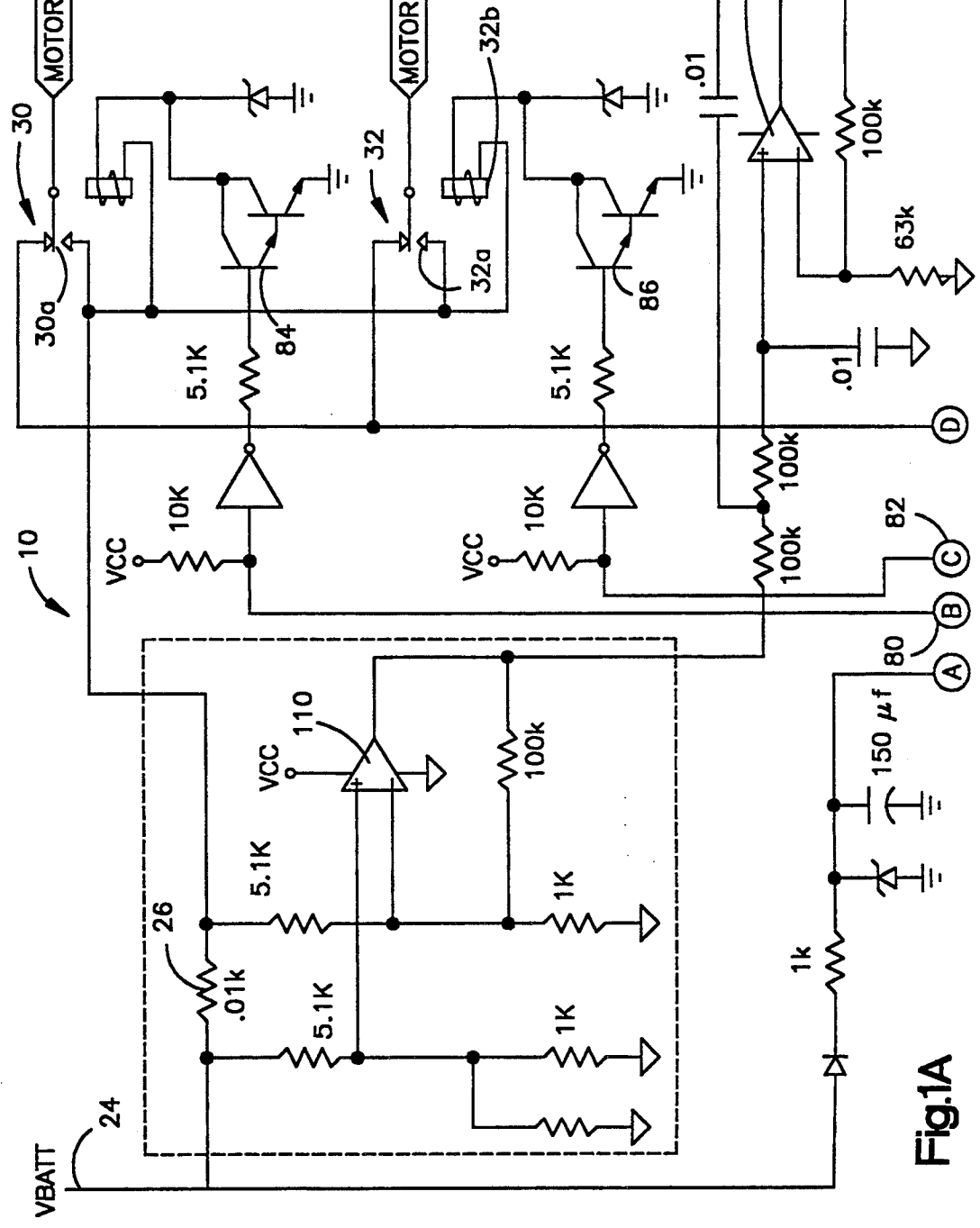


Fig.1A

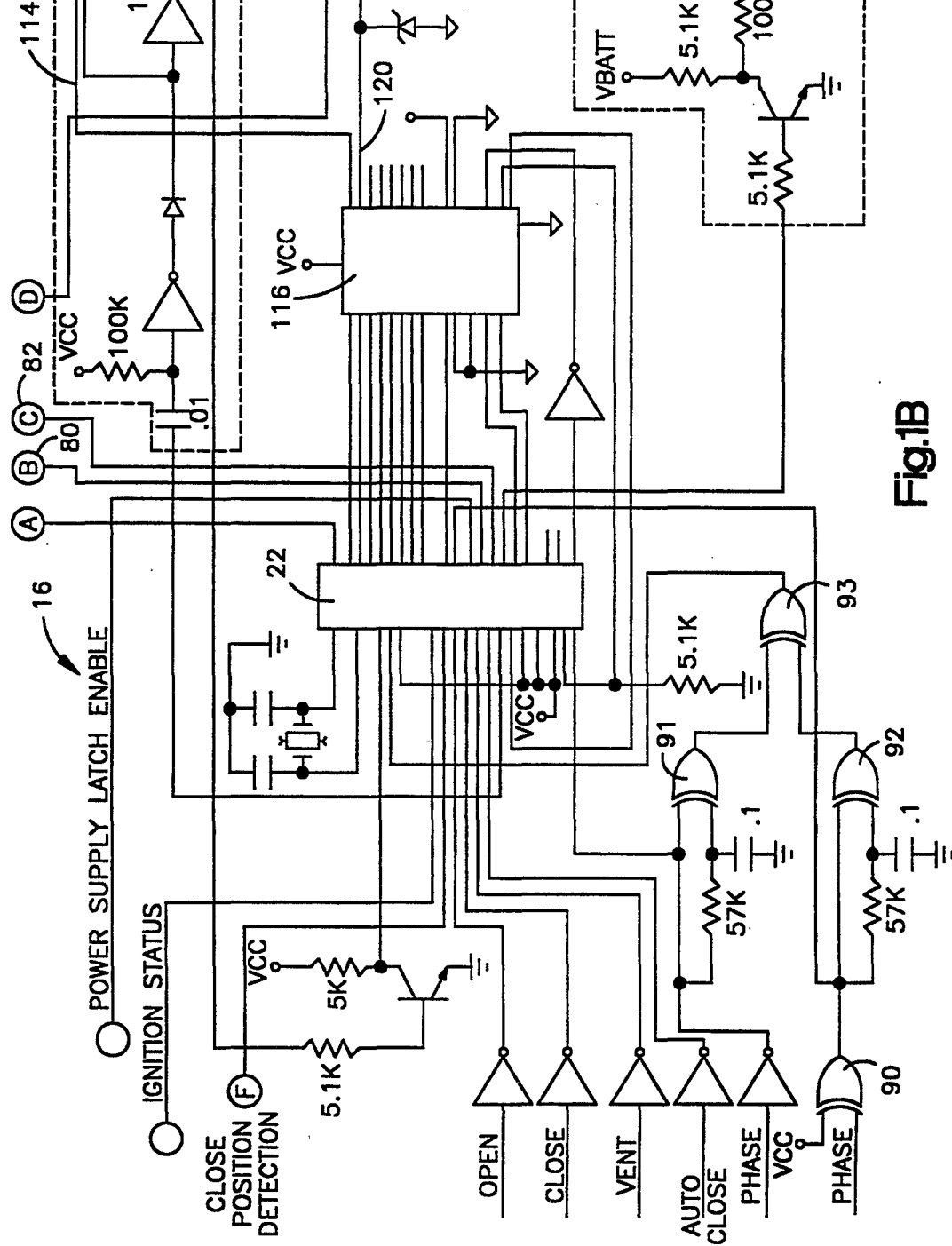


Fig.1B

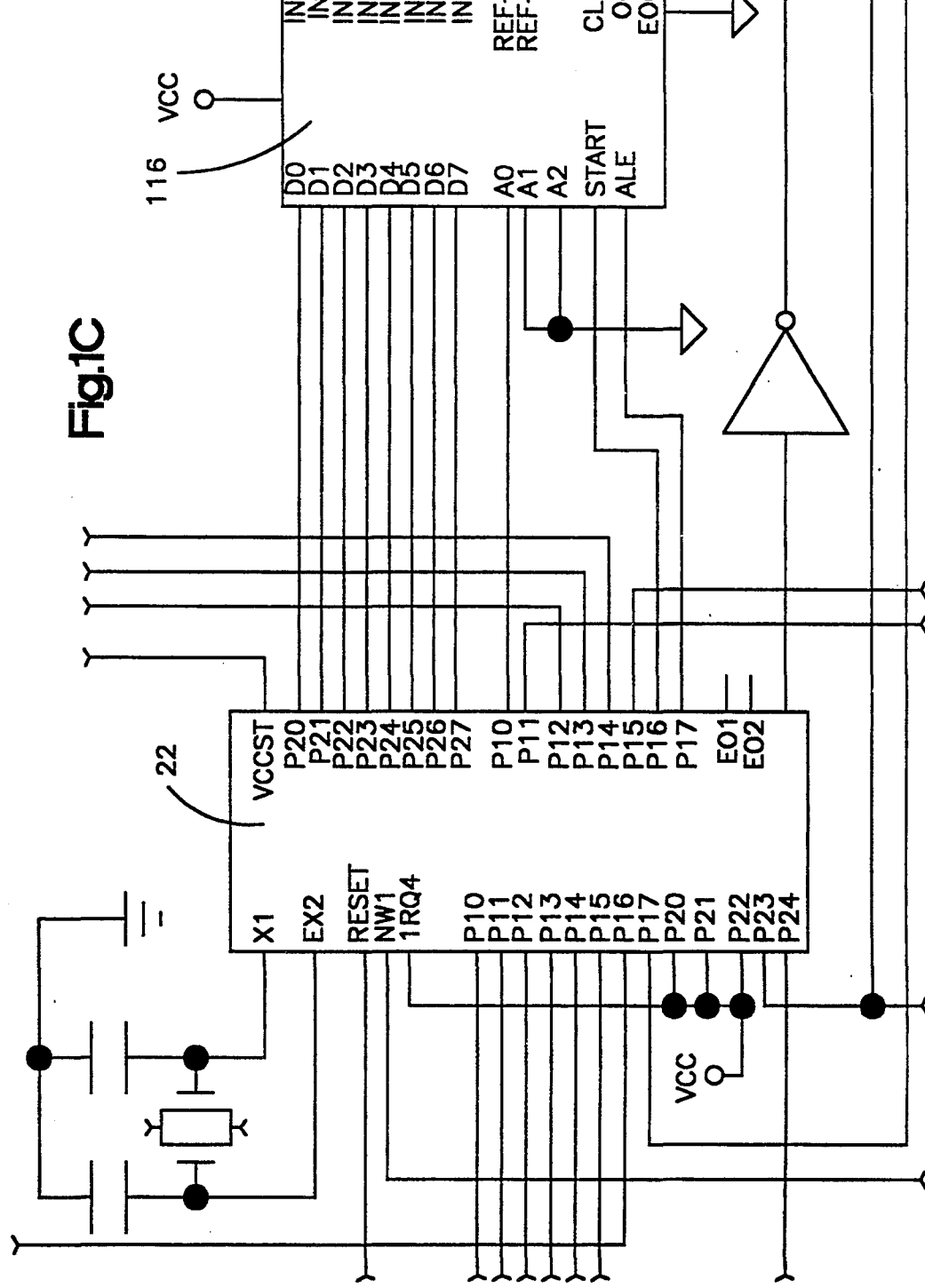
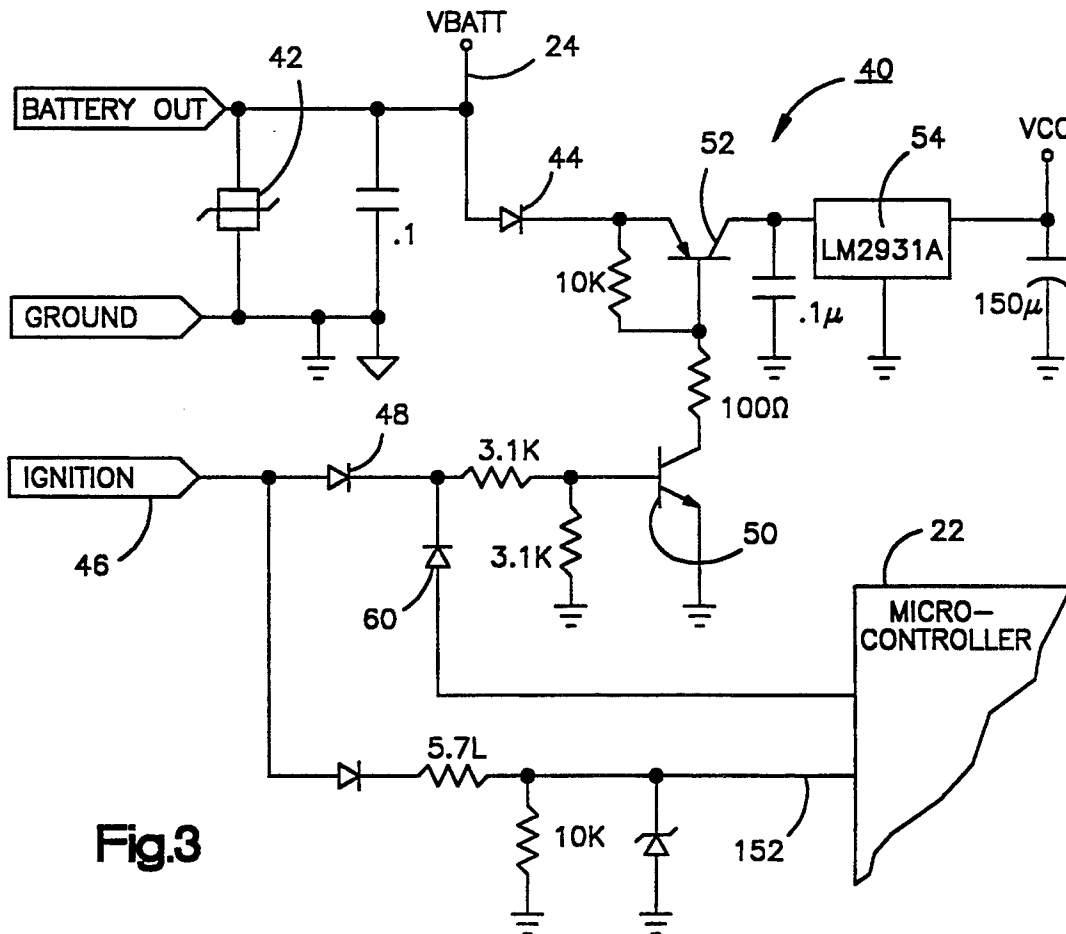
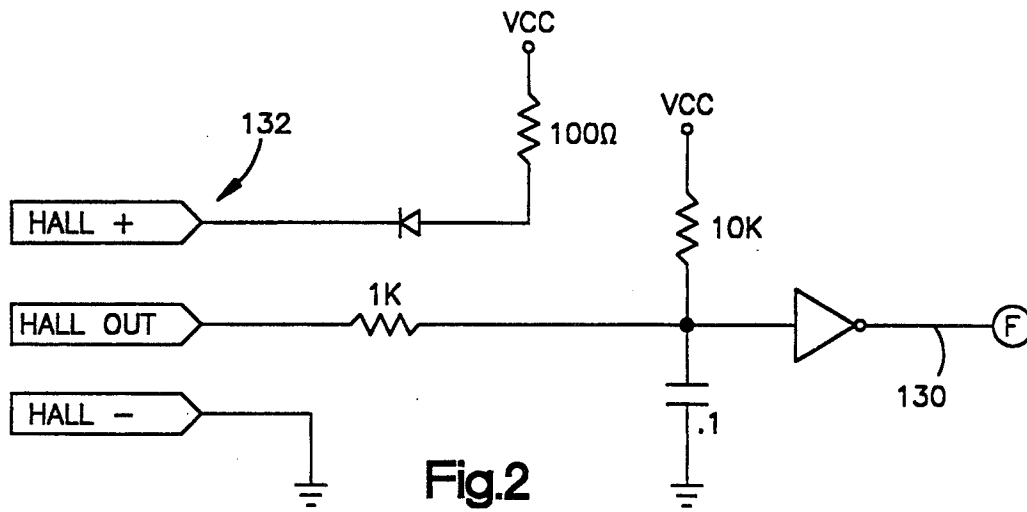


Fig.1C



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