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[54] **METHOD AND APPARATUS FOR APPLYING ASYMMETRIC BIPHASIC TRUNCATED EXPONENTIAL COUNTERSHOCKS**

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[73] Assignee: **Telectronics Pacing Systems, Inc.**, Englewood, Colo.

[21] Appl. No.: **574,510**

[22] Filed: **Aug. 28, 1990**

Related U.S. Application Data

[63] Continuation of Ser. No. 397,637, Aug. 23, 1989, abandoned, which is a continuation of Ser. No. 145,515, Jan. 19, 1988, abandoned.

[51] **Int. Cl.**[5] **A61N 1/36**

[52] **U.S. Cl.** ..... **128/419 D**

[58] **Field of Search** ..... 128/419 D

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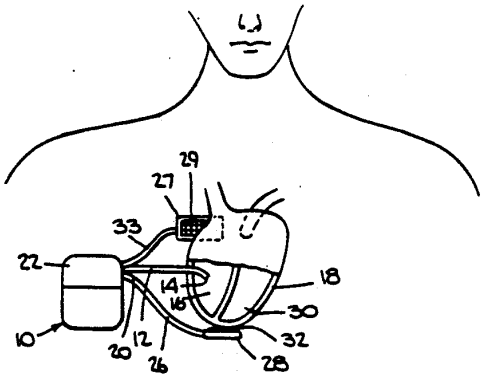
Attorney, Agent, or Firm—Gottlieb, Rackman & Reisman

[57] **ABSTRACT**

A method and apparatus for applying an asymmetric biphasic exponential waveform countershock to the heart useful in an implantable cardioverter or defibrillator, wherein the second phase has a start amplitude of substantially one half that of the first phase, and wherein the polarity of a capacitor discharging through a current path including the heart is reversed. A voltage reversing circuit may include a voltage shifter which shifts voltage associated with switching elements in the circuit to reduce voltage stresses in the switching elements.

18 Claims, 4 Drawing Sheets



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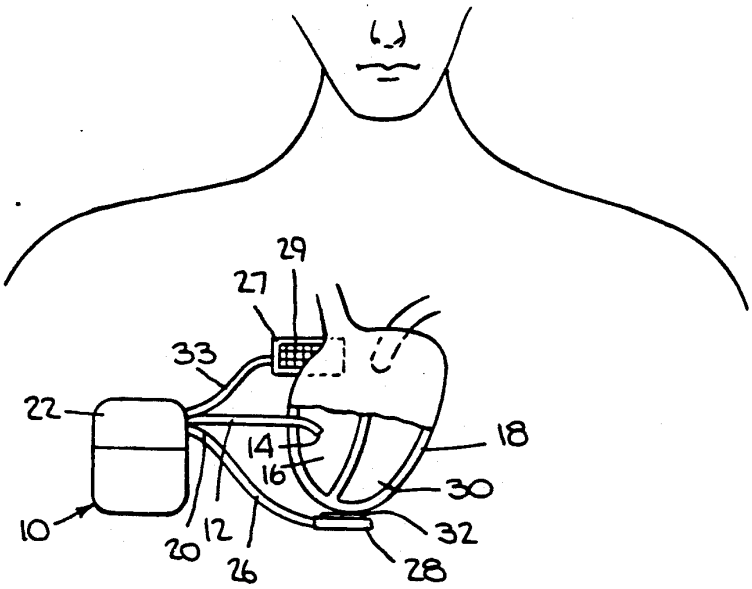
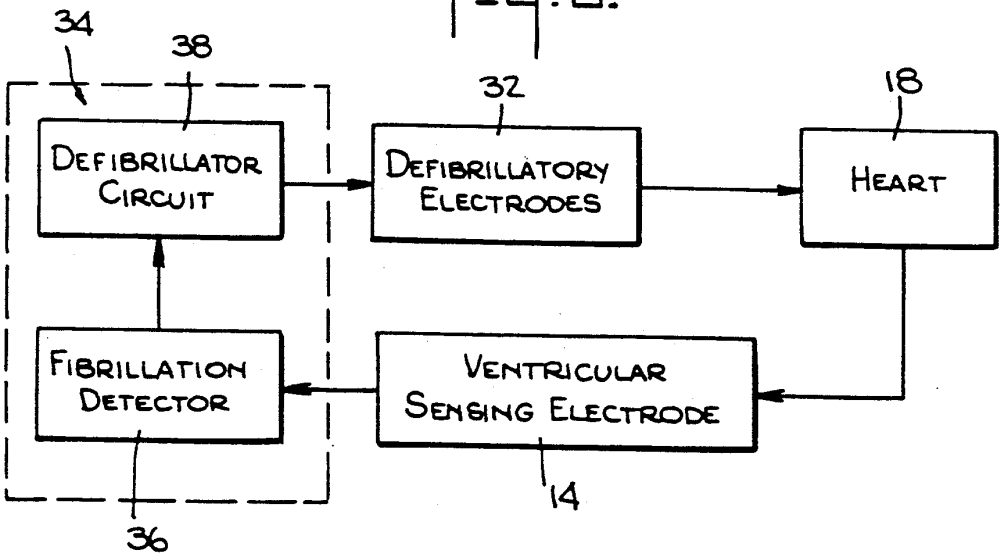
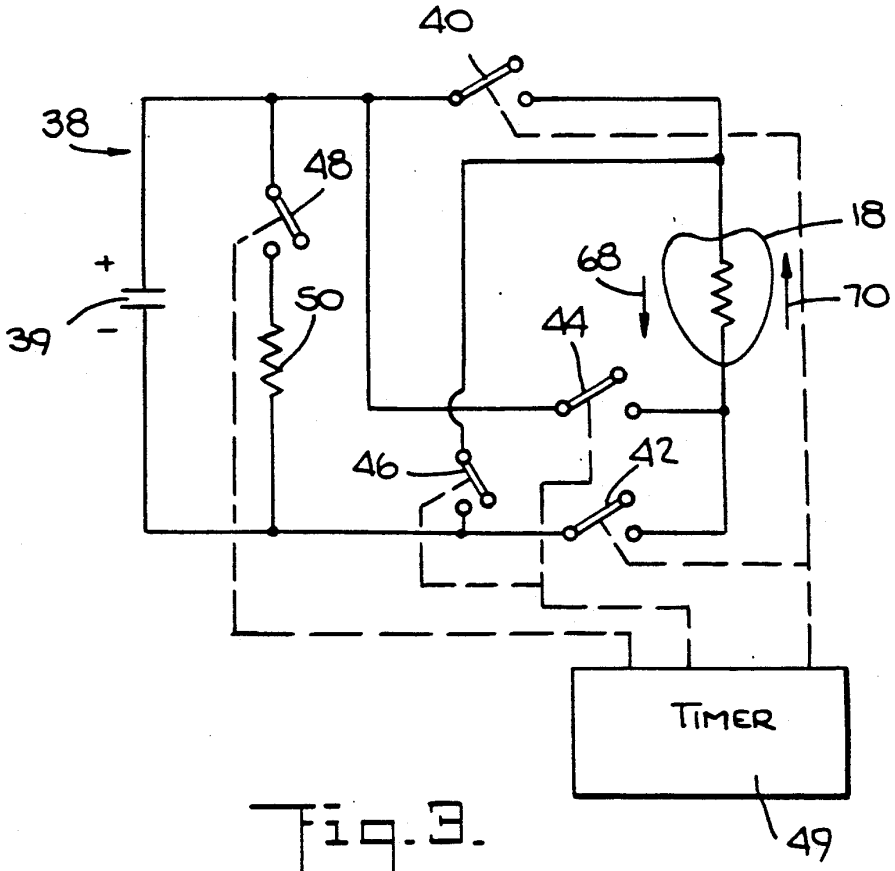


Fig. 1.

Fig. 2.





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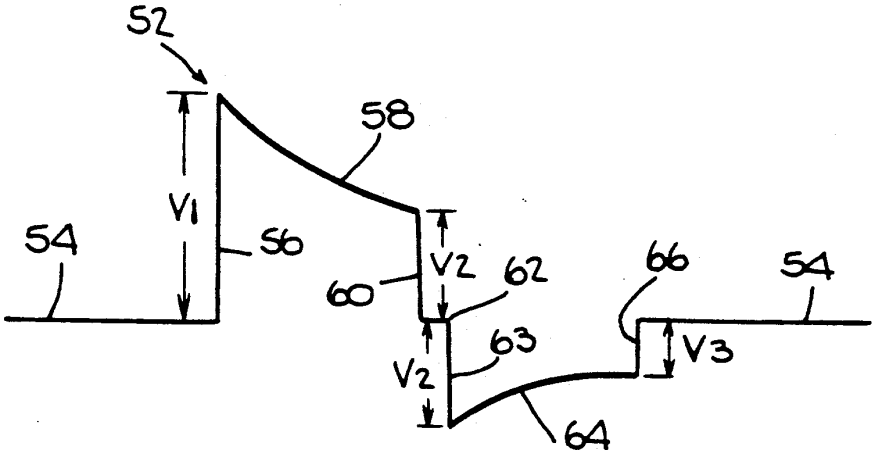

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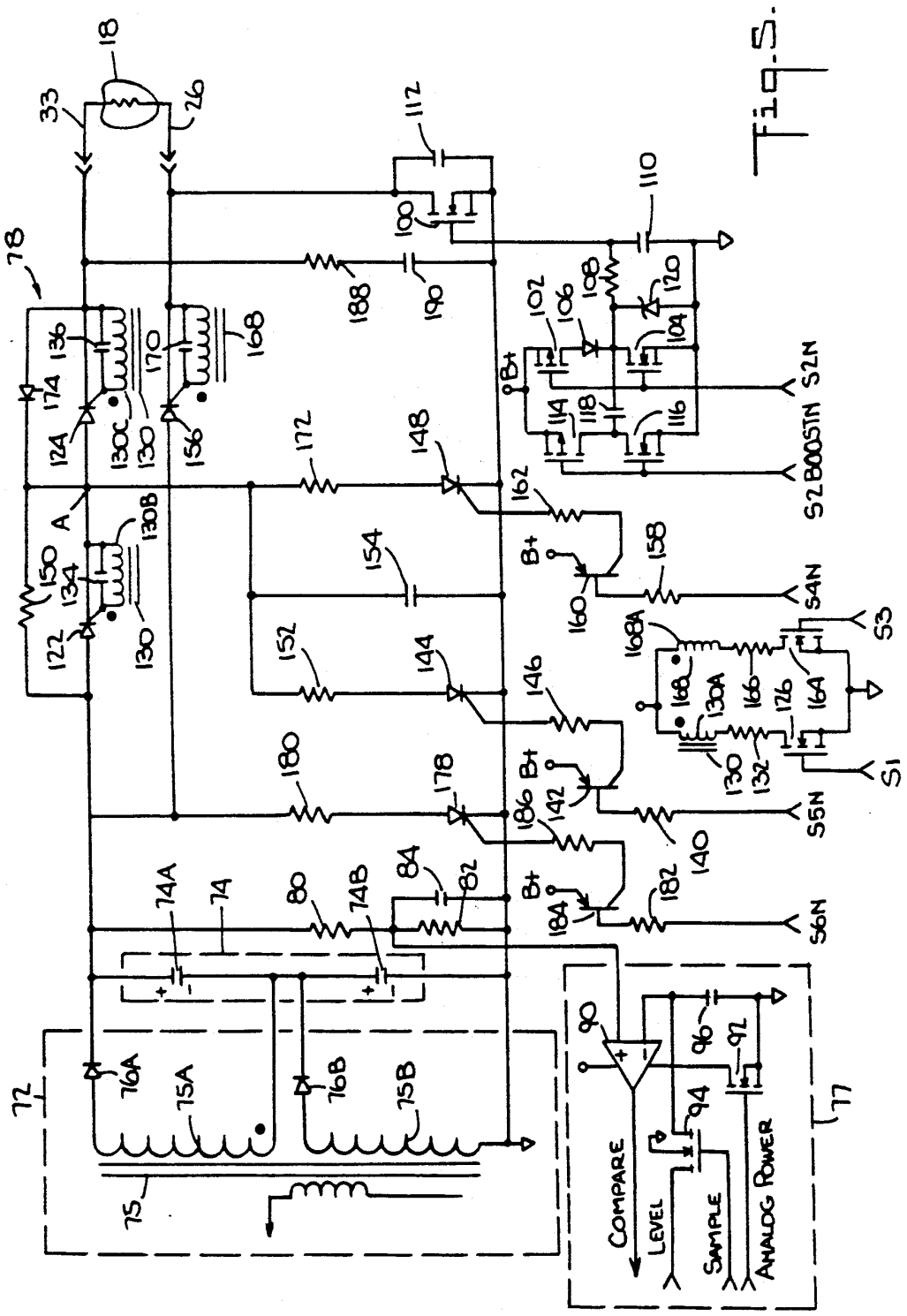

Fig. 5.

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