

[54] **PROCESS AND APPARATUS FOR CASE HARDENING OF FERROUS METAL WORK PIECES**

Attorney, Agent, or Firm—Zachary T. Wobensmith, 2nd; Zachary T. Wobensmith, III

[75] **Inventors: William R. Jones, Chalfont; Prem C. Jindal, Feasterville, both of Pa.**

[57] **ABSTRACT**

A process and apparatus for case hardening of ferrous metal work pieces is described in which the work pieces

FIG. 1

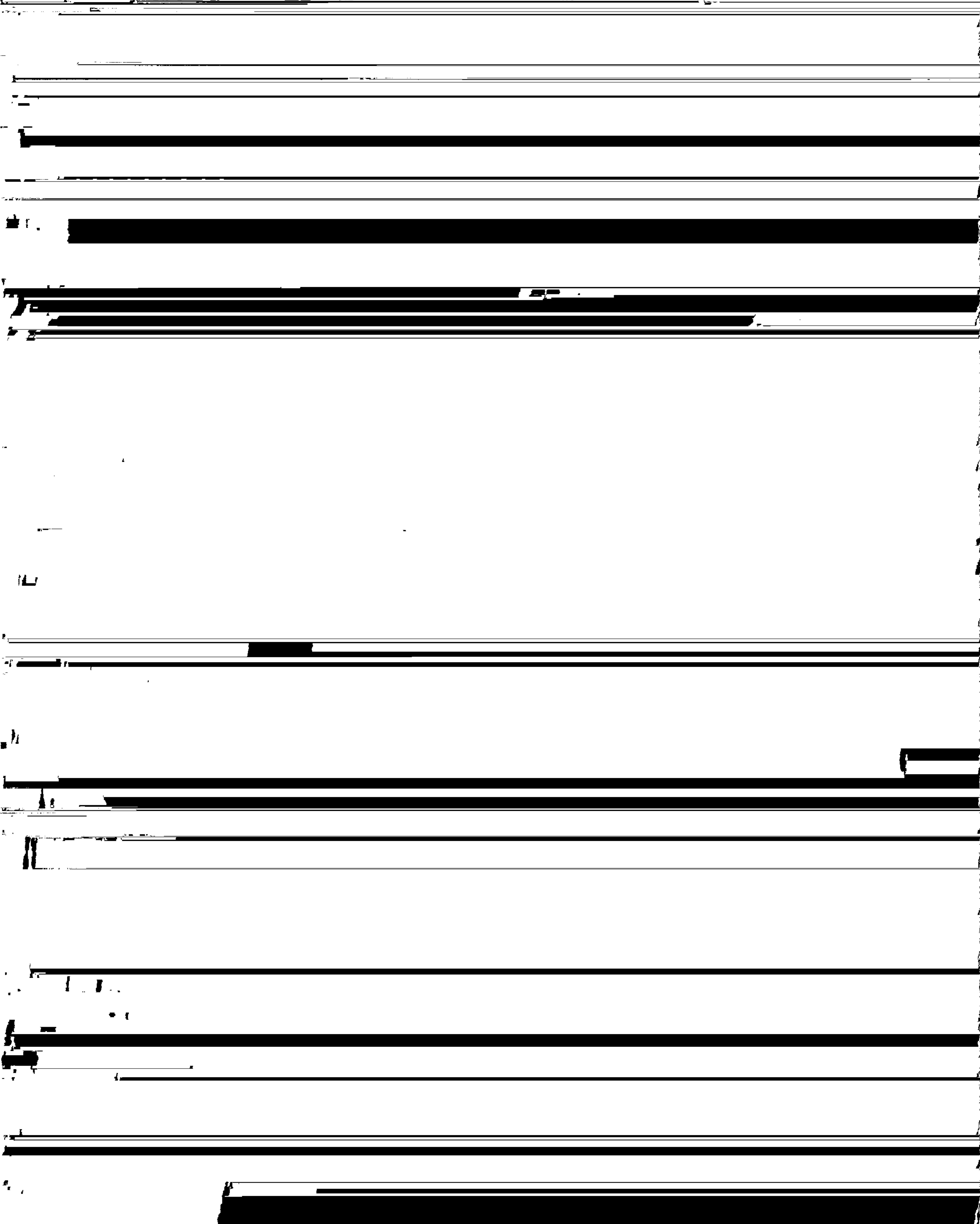
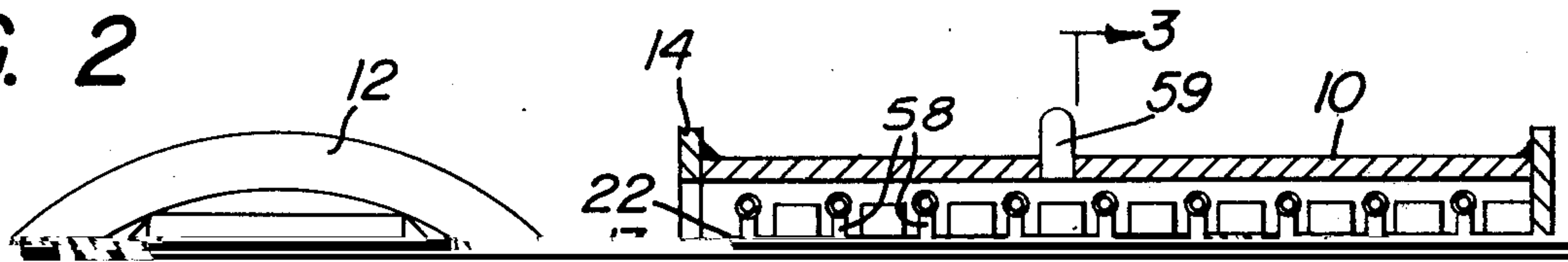


FIG. 2



**PROCESS AND APPARATUS FOR CASE
HARDENING OF FERROUS METAL WORK**

If is a further object of the present invention to provide simple but effective methods and apparatus for

PIECES

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to case formation on ferrous

tive electrical circuitry for ionization.

5 Other objects and advantageous features of the present invention will be apparent from the description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The chamber 20 is provided with a vacuum pump 33 for evacuation of the chamber 20 connected to an open

For this purpose, the power leads 60 and 61 have

ing in shell 10 by a pipe 34 with a vacuum roughing valve 35 interposed in the pipe 34 and with a pipe 36 bypassing the roughing valve 35 and having a manually controlled bypass valve 37 therearound

connected to the primary winding of a step up transformer 82. The secondary winding of the transformer 82 has its terminals connected by conductors 83 and 84 to a bridge rectifier 85 to provide full wave rectified

cooling phase of the cycle.

The heating and cooling of the work pieces 30 as herein set forth results in substantial time savings and

the means for supplying an ionizable gas includes a source of carbon containing gas.

6. Apparatus as defined in claim 1 in which