United States Patent [19]

Nicholls et al.

[11] **Patent Number:** 5,541,434

[45] **Date of Patent:** Jul. 30, 1996

[54] **SEMICONDUCTOR DEVICE INCORPORATING A CONTACT FOR ELECTRICALLY CONNECTING ADJACENT PORTIONS WITHIN THE SEMICONDUCTOR DEVICE**

[75] Inventors: **Howard C. Nicholls**, Wales; **Michael J. Norrington**, Essex, both of United Kingdom

[73] Assignee: **Inmos Limited**, United Kingdom

[21] Appl. No.: **119,519**

[22] Filed: **Sep. 10, 1993**

[30] **Foreign Application Priority Data**

Sep. 11, 1992 [GB] United Kingdom 9219268

[51] **Int. Cl.**^{6} **H01L 29/76**
[52] **U.S. Cl.** **257/383**; 257/641; 257/900
[58] **Field of Search** 257/382, 383, 257/900, 393, 640, 641, 649, 903, 344, 408

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,042,953	8/1977	Hall .	
4,859,630	8/1989	Josquin	257/383
4,912,540	3/1990	Sander et al. .	
5,099,308	3/1992	Murayama	357/71
5,148,247	9/1992	Miura et al.	257/330
5,210,429	5/1993	Adan	257/393
5,234,850	8/1993	Liao	257/344
5,245,210	9/1993	Nishigoori	257/383

FOREIGN PATENT DOCUMENTS

|		
0094559A1	12/1983	European Pat. Off. .
0127020A2	12/1984	European Pat. Off. .
0272050	6/1988	European Pat. Off. .
0272051A2	6/1988	European Pat. Off. .
0308964A2	8/1990	European Pat. Off. .
63-62380	3/1988	Japan 257/640
63-278256	11/1988	Japan .
2-28939	1/1990	Japan 257/900
2-156542	6/1990	Japan 257/383
3-278576	12/1991	Japan 257/640

Primary Examiner—Sara W. Crane
Assistant Examiner—Courtney A. Bowers
Attorney, Agent, or Firm—Felsman, Bradley, Gunter & Dillon, LLP

[57] **ABSTRACT**

A semiconductor device comprising a silicon substrate, an oxide layer on the silicon substrate, a doped polysilicon region disposed on the oxide layer, a dielectric layer which has been deposited over the doped polysilicon region and the silicon substrate, a contact hole which is formed in the dielectric layer and extends over respective laterally adjacent portions of the doped polysilicon region and the silicon substrate and a contact which has been selectively deposited in the contact hole which electrically connects the said portions together. The invention also provides a method of fabricating a semiconductor device incorporating a refractory metal contact, the method comprising the steps of: a) providing a semiconductor substrate having an oxide layer thereon and a doped polysilicon region disposed on the oxide layer; (b) depositing a dielectric layer over the doped polysilicon region and over the silicon substrate; (c) forming a contact hole in the dielectric layer which exposes a portion of the doped polysilicon region and a laterally adjacent portion of the silicon substrate; and (d) selectively depositing a contact into the contact hole thereby electrically to connect together the doped polysilicon region and the silicon substrate.
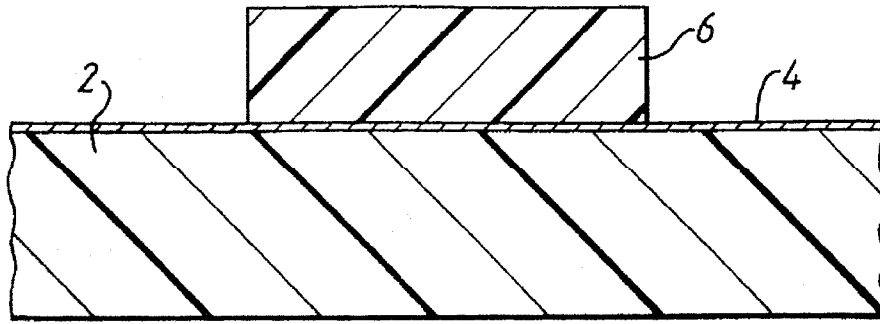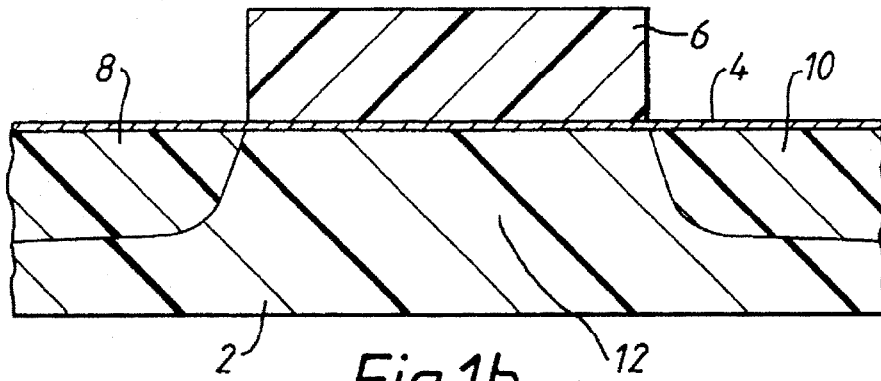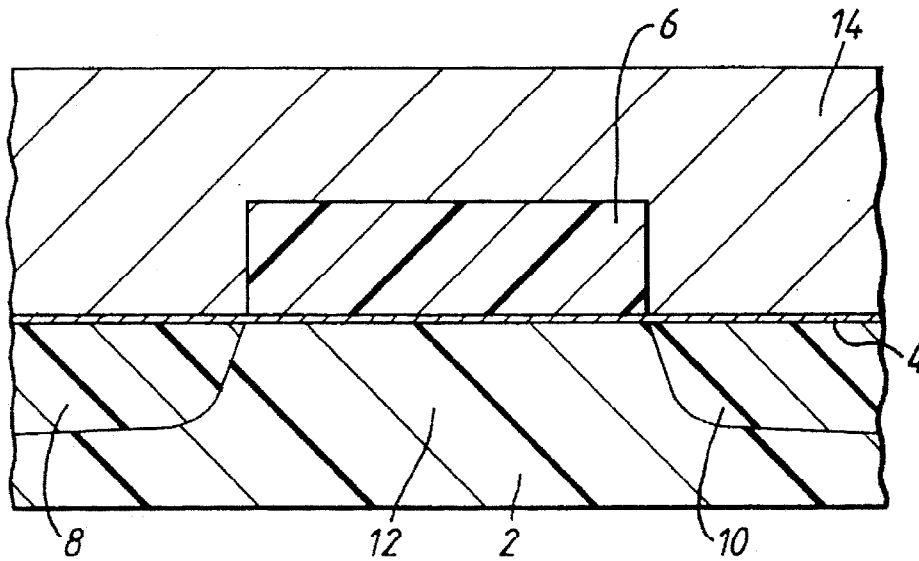
10 Claims, 7 Drawing Sheets
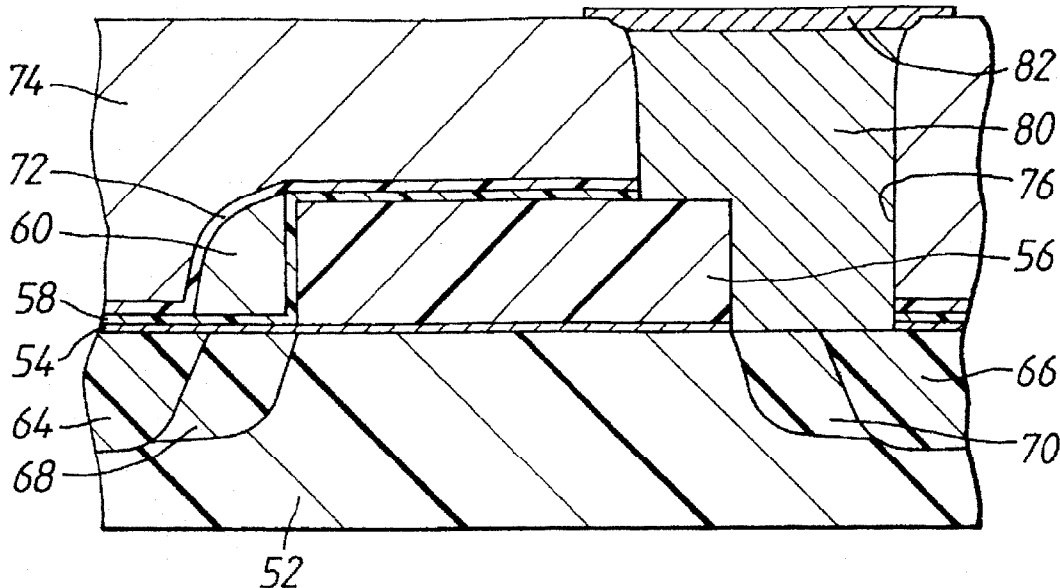
Fig.1a

Fig.1b

Fig.1c
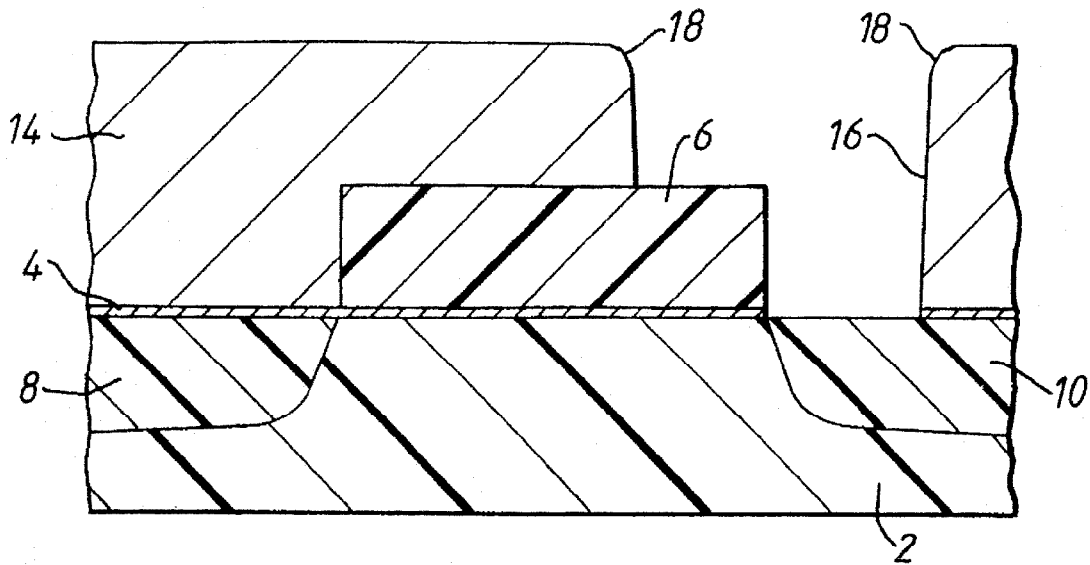
Fig.1d

Fig.1e
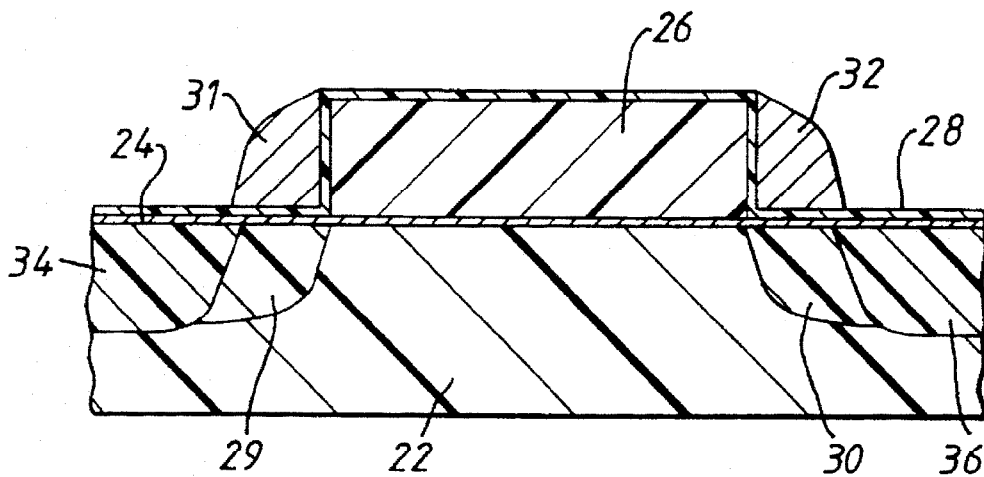
Fig.2a

Fig.2b

Fig.2c

Fig.2d

Fig.2e

Fig.2f
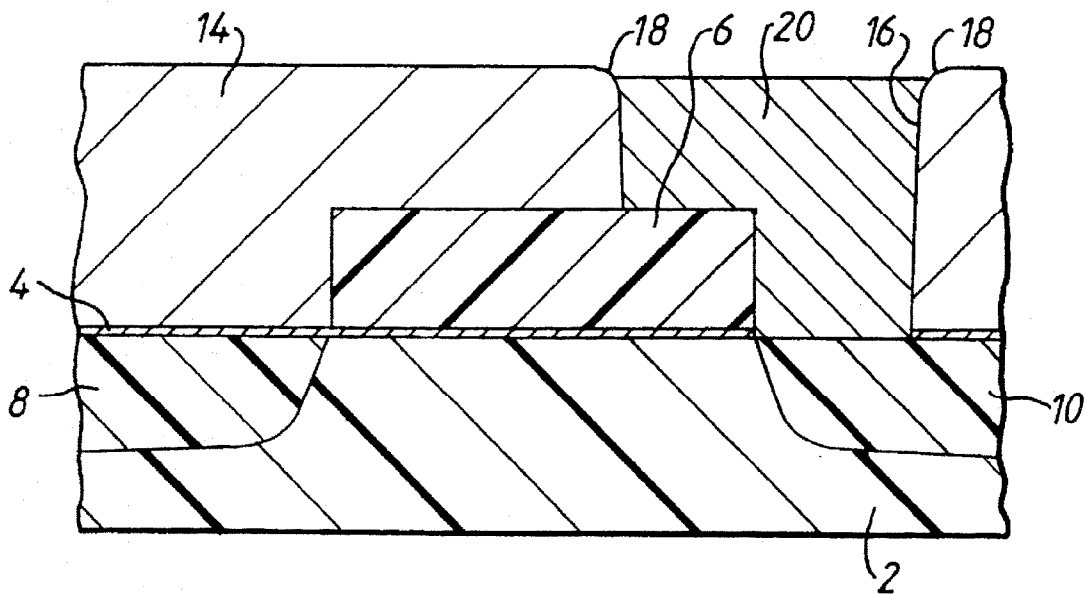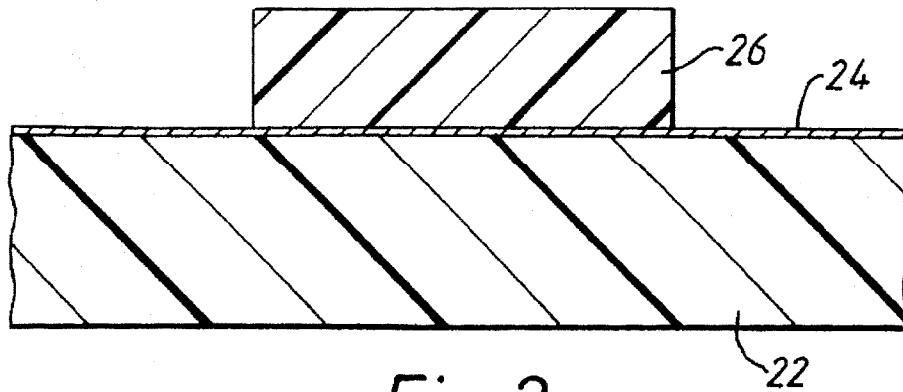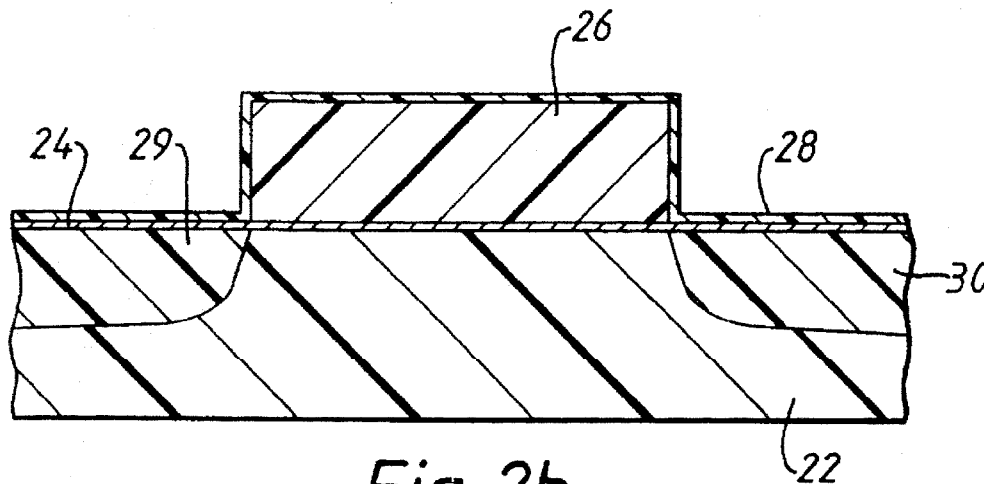
DOCKET ALARM
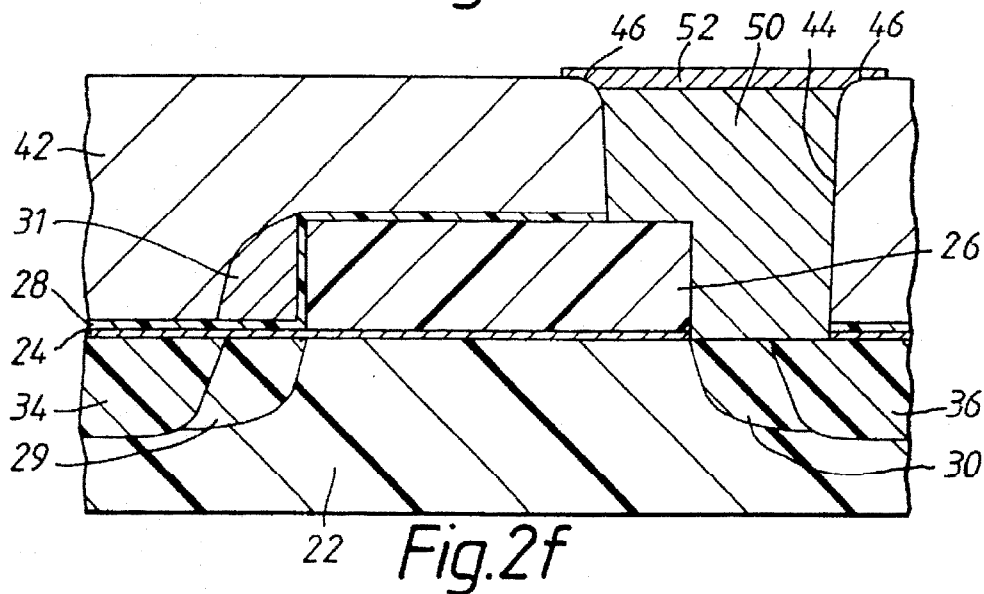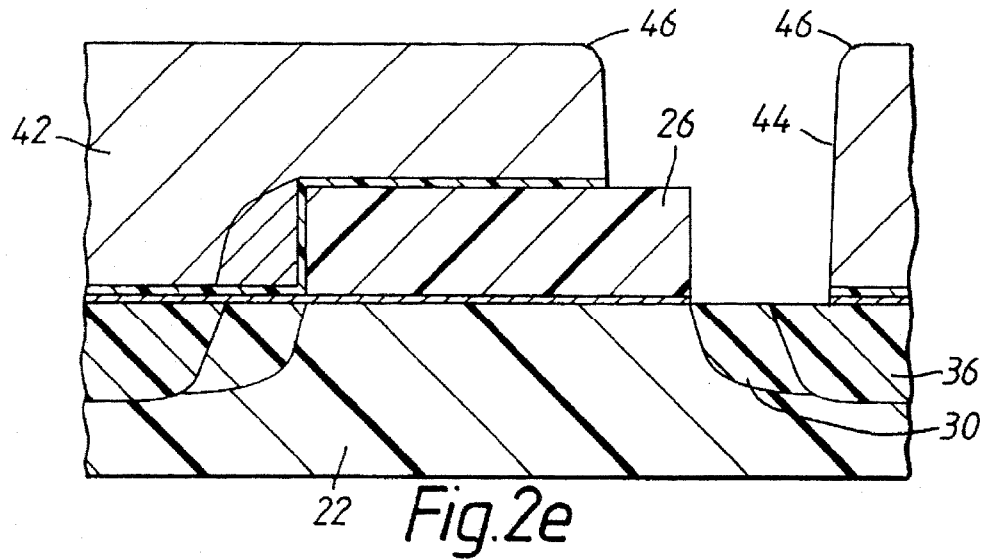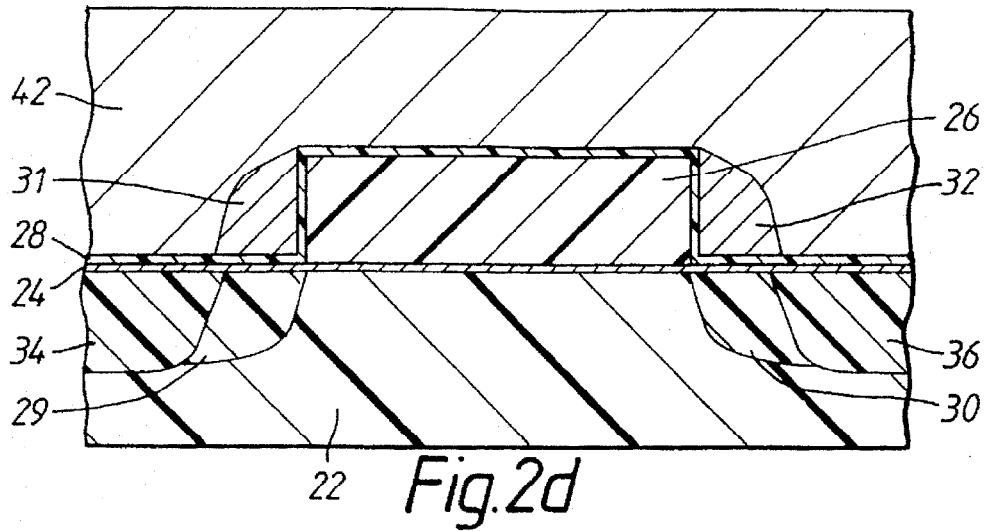
Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.

fastcase
Smarter legal research.