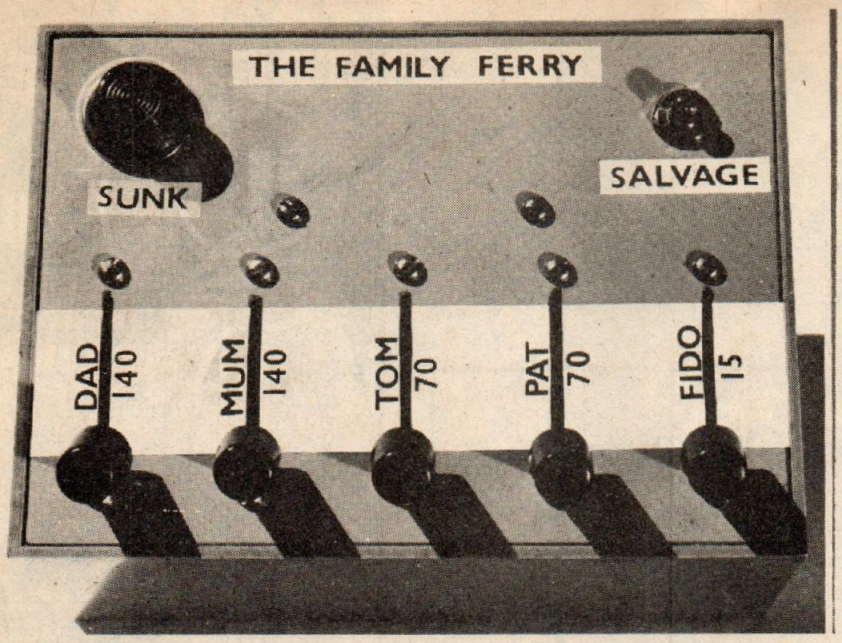

Fig. 1.

THE FAMILY FERRY

An old problem updated – electronically

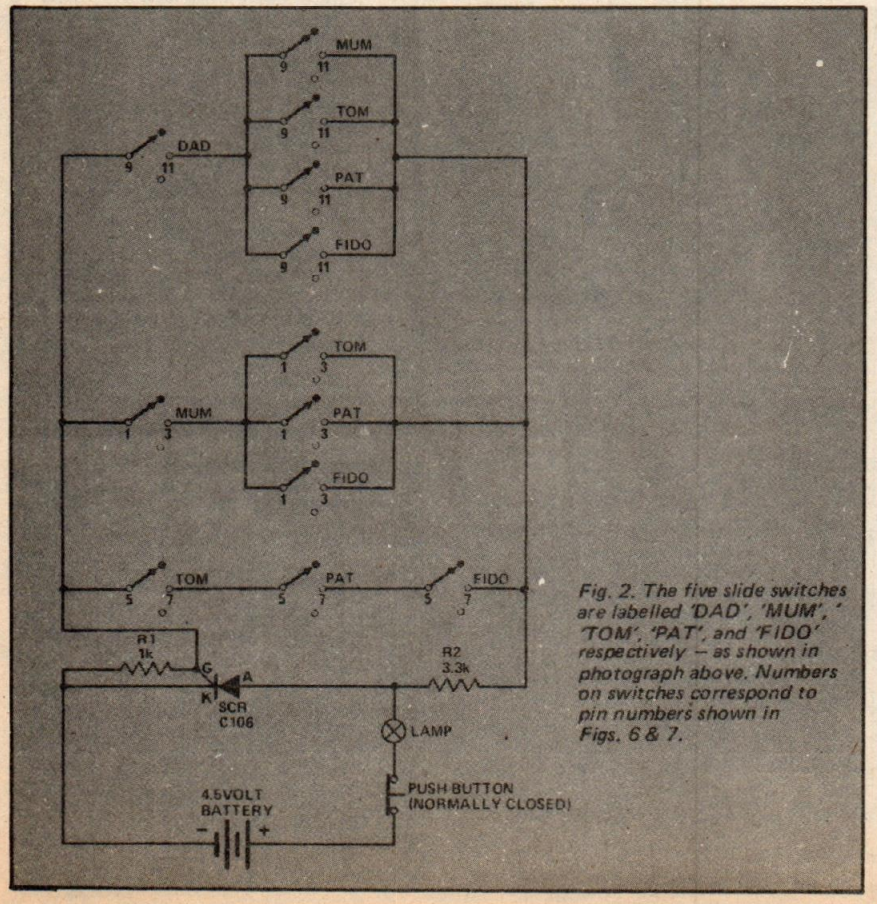

Fig. 2. The five slide switches are labelled 'DAD', 'MUM', 'TOM', 'PAT', and 'FIDO' respectively – as shown in photograph above. Numbers on switches correspond to pin numbers shown in Figs. 6 & 7.

THE ORIGIN of this problem is not known. The writer heard it a while back, and thought it would be fun in electronic form. So here's the story:

> A family comprised Dad, who weighed in at 140 lbs, Mum, who also tipped the scales at 140 lbs; son Tom – 70 lbs, and daughter a nimble 70 lbs, plus Fido a well fed dog of 15 lbs. They all came to a river which they wanted to cross. In the boat which was tied up there, was a notice which read 'CAUTION! MAXIMUM LOAD 150 lb.' Now this river was infested with crocodiles, so no one was keen on swimming. Problem: how did all the family get across the river?

The circuit is arranged so that the alarm operates while switches are being moved from side to side – if the total load they represent exceeds 150 lbs.

Each member, including the dog, is represented by a three-position lever switch.

Only the contacts in the middle position are used, as they are closed while the levers are passing through the 'dangerous' position, i.e., wh people are in the boat. Fig. illustrates the arrangement. The alarm is a red pilot lamp marked SUNK.

The circuit is shown in Fig. 2. The lever switches used are 3-pole three position, although the links between poles are not shown in the circuit. All the levers are shown in one side position, and they close circuits only momentarily as they pass through their centre positions. This brief contact applies a voltage to the gate of the silicon controlled rectifier SCR, which turns it on and leaves it on, thus leaving the SUNK light turned on. The moving contacts on the switches are so wide that if the switches are moved reasonably together there is no chance of failing to make a circuit when one should be made.

To reset the game after the boat has been sunk, a SALVAGE push button is provided. This is a normally closed push button, which, on being pushed, simply opens the circuit momentarily

PARTS LIST – ETI 230

R1 Resistor 1k ½W 5%
R2 " 3.3k " "

Switches 5 by 3 pole 3 position rotary
1 by normally closed push button.
SCR1 Silicon controlled rectifier C106 or similar
4.5 volt battery, 4.5 volt pilot lamp.