where λ has the value $3{\cdot}0 \pm 0{\cdot}1 \times 10^{-7}$ per bar. In order to achieve the optimum sensitivity the balance was always operated with the piston and load system in a state of free rotation. The standard corrections were applied to account for the small difference of level between the piston–cylinder assembly and the mercury cell.

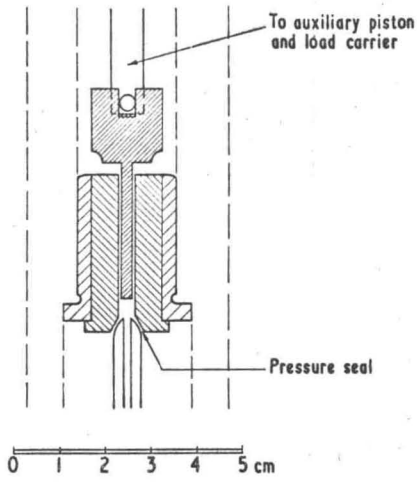

Figure 3. Diagram of piston–cylinder assembly.

2.5. *Electrical resistance measurement*

The electrical resistance of the mercury sample was determined by measuring the potential difference across it with a fixed value of direct current. A recording potentiometer was used to measure the approximate fraction of mercury frozen at the start of each experimental run, this being replaced by a sensitive dial potentiometer and galvanometer arrangement for the final observations. The normal direct current through the mercury was about 0·5 mA, but this was increased by a factor of 2 for a limited series of measurements in order to check whether the heating effect was appreciable. This, however, produced no significant change in the observed freezing pressure, indicating that such effects were unimportant.

2.6. *Observational procedure*

In view of the strong dependence of the freezing pressure upon temperature it is essential that departures from equilibrium, such as variations in the fluid pressure, are kept to a minimum while the critical measurements are being made. The procedure adopted for the manipulation of the pressure system and the recognition of the transition point is thus of particular importance.

With the ice bath set up for a sufficient time for temperature stability to be reached, the pressure on the mercury cell was first slowly increased until the fraction of mercury frozen reached the desired value as indicated by the recording potentiometer, the load on the pressure balance being adjusted to approximately the correct value for equilibrium. The combination of pressure vessel, pressure balance and screw press (figure 1) was then isolated from the remainder of the pressure system and the dial potentiometer and galvanometer brought into operation. The load on the pressure balance was then adjusted in small steps until the exact equilibrium point was found. Since the pressure balance in its undisturbed state