

ISR RUNNING-INRun 68; 20 bunches, 26 GeV/cStacking at bottom in R1, at top in R21. Mysterious sudden losses in R1

The unexplained sudden steps in the beam current, as experienced since Run 64, were still present and very disturbing. I have marked some of them with a "?" on the PIDC recording, (e.g., Figs. 5 and 6).

2. Stacking with FS 26 in R1

More than 5.3 A were reached in the first stack, (Fig. 1), then sudden loss occurred (the filter output was not watched). The stacking rate was reduced around 35 cycles (crossing of a resonance?) and a scan (made when the losses (1) had reduced the current to 2.6 A) shows a characteristic dip at 6.2 "HP cm" from injection, (Fig. 2). This dip also seems to appear on all scans made later by L. Resegotti with FS 26.

3. Stacking with SF 26 in R1

Since we appeared to be limited by the Brick Wall with FS 26, more sextupole field was put on for the last stacks in R1, (working line SF 26). In spite of this we saw sawtoothing around the maximum current mostly accompanied by filter output, (Figs. 3 and 5). One such stack was stopped at 4 A (Fig. 4) and an attempt was made to blow-up the vertical beam size by means of repeated firing of the vertical Q-kicker. Instead, firing this kicker led to sudden heavy loss accompanied by strong filter output.

4. Correlation between beam current and vacuum pressure in R1, (cf. also E. Fischer)

During the first stack all pressure readings above a certain threshold were recorded (cf. E. Fischer). From then on, gauge 517.7, where one of the strong pressure rises was observed, was recorded on the

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second trace of the PIDC recorder. Figures 3, 4, 5 (towards the end of the run) and Figure 6 a to d show examples\*. The pressure seems to be correlated with the current. When the stacking is halted, the pressure continues to rise for a while - the more so, the higher the current and pressure - then it settles at a constant value. When stacking is resumed, the pressure starts to follow the current with a small delay. When the beam is lost (mostly because of the mystery effect (1)) the pressure starts to fall instantly.

5. Clearing voltage in 733

In SS 733 the clearing electrodes are replaced by PI electrodes. Positive voltages of 700 to 1000 V were applied to the PI plates on several occasions during this run (J. Borer). Switching the voltages on produced a pressure rise (733 was already one of the pressure-bump locations). At one time an effect on the beam decay rate was believed to be seen, but this could not be confirmed. At the end of the run (Fig. 5) the PI voltage had certainly no effect on the decay rate (at 3.9 A).

6. Stacking in R2, FS 26

A stack to 3.6 A was made in R2 (Fig. 7) and vacuum pressure bumps recorded by E. Fischer.

W. Schnell

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\* Note that there is 1 cm offset between pens

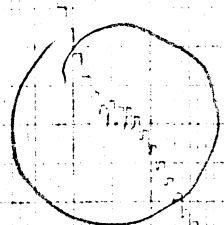
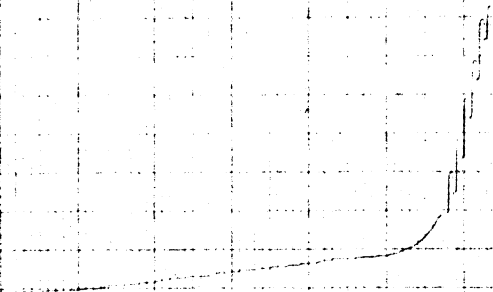
Distribution

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↑

PIDC R2



25 WASH / WASH

5.3A

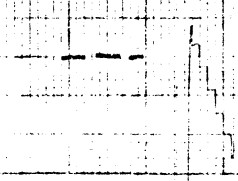


Fig 1

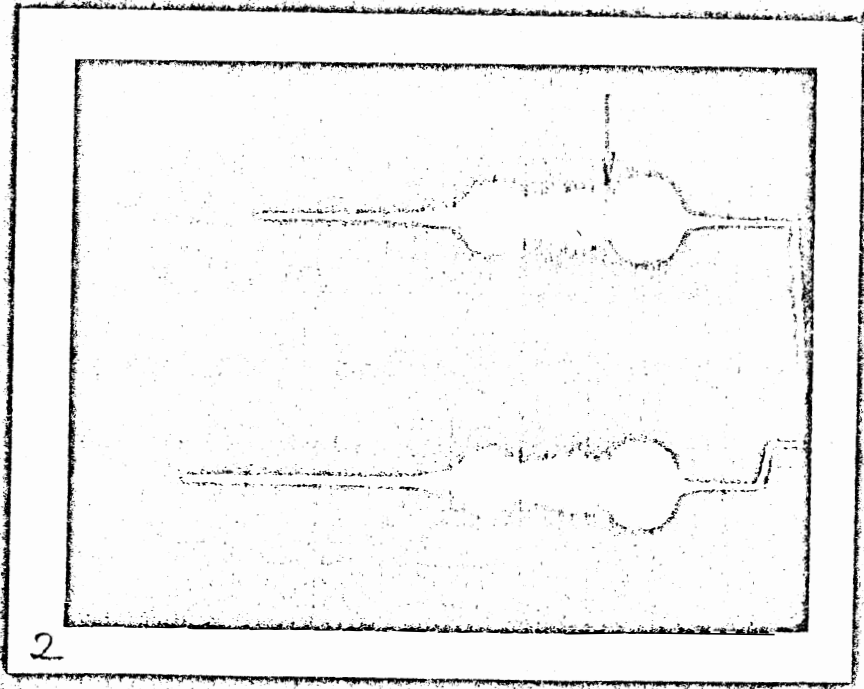
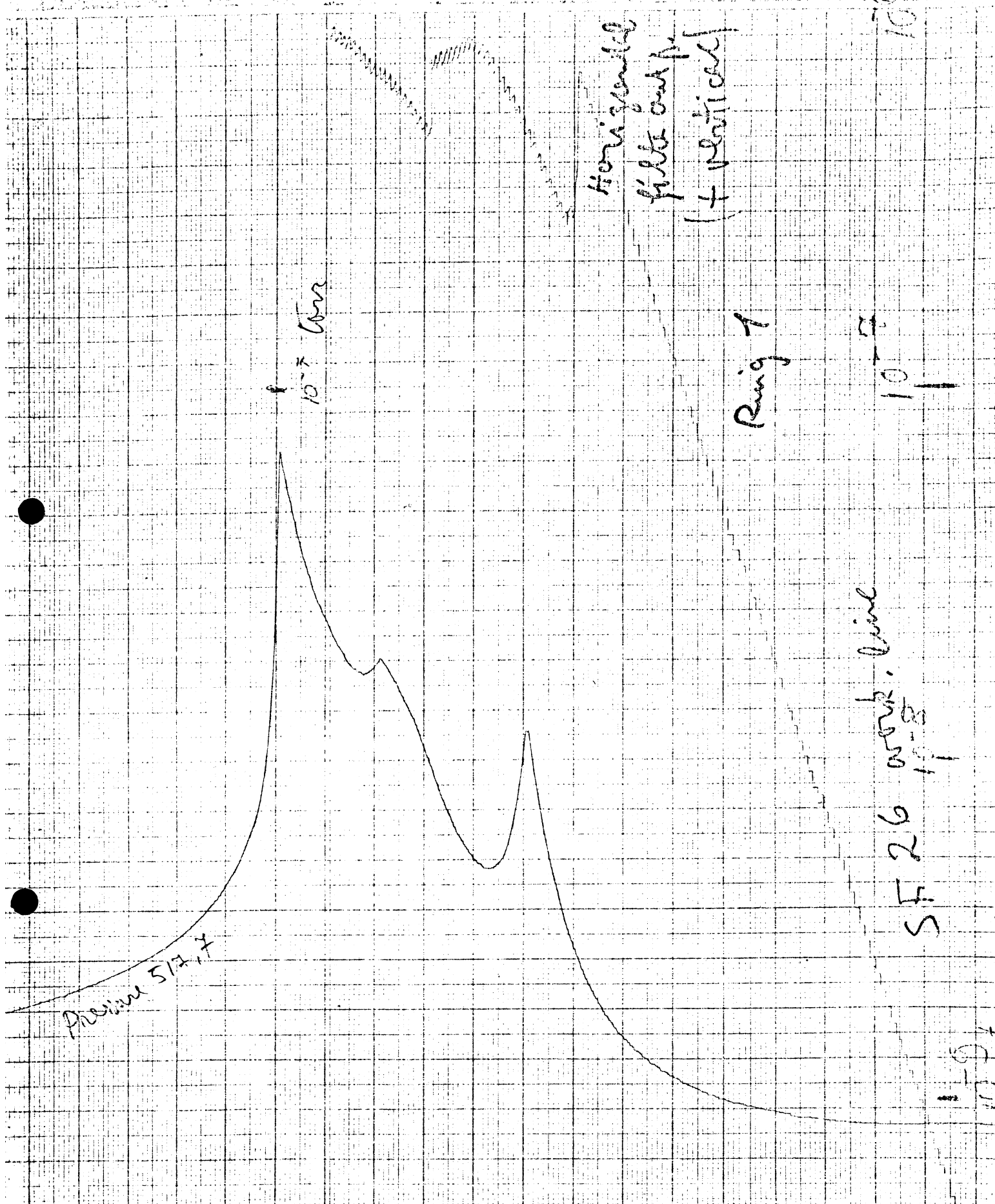


Fig 2



SF 26 work. bird

Fig 3

10/1

10/1

10/1

$10^{-4}$  Torr

$10^{-8}$  Torr

$10^{-9}$  Torr

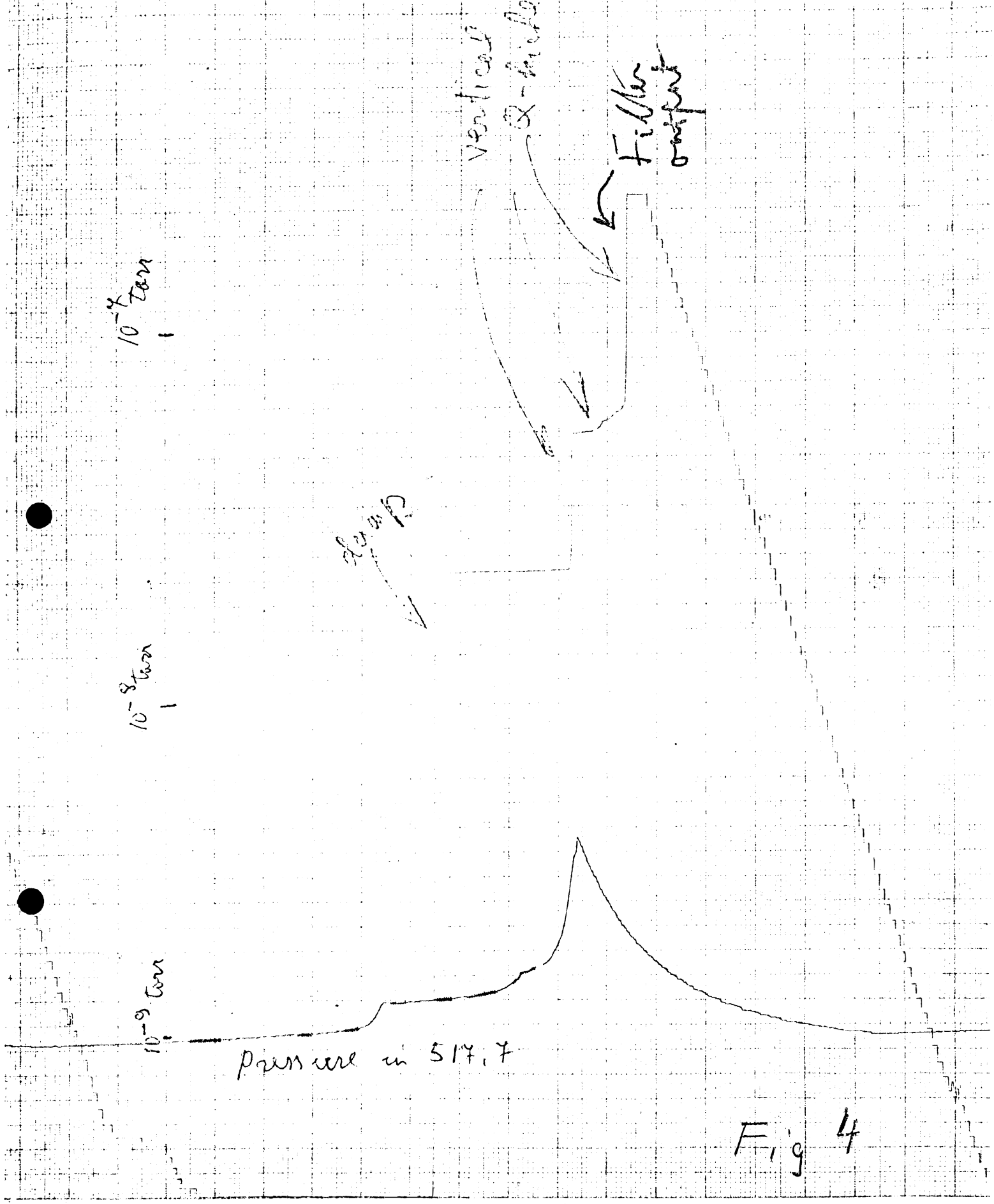
Change

Vertical  
2-inches

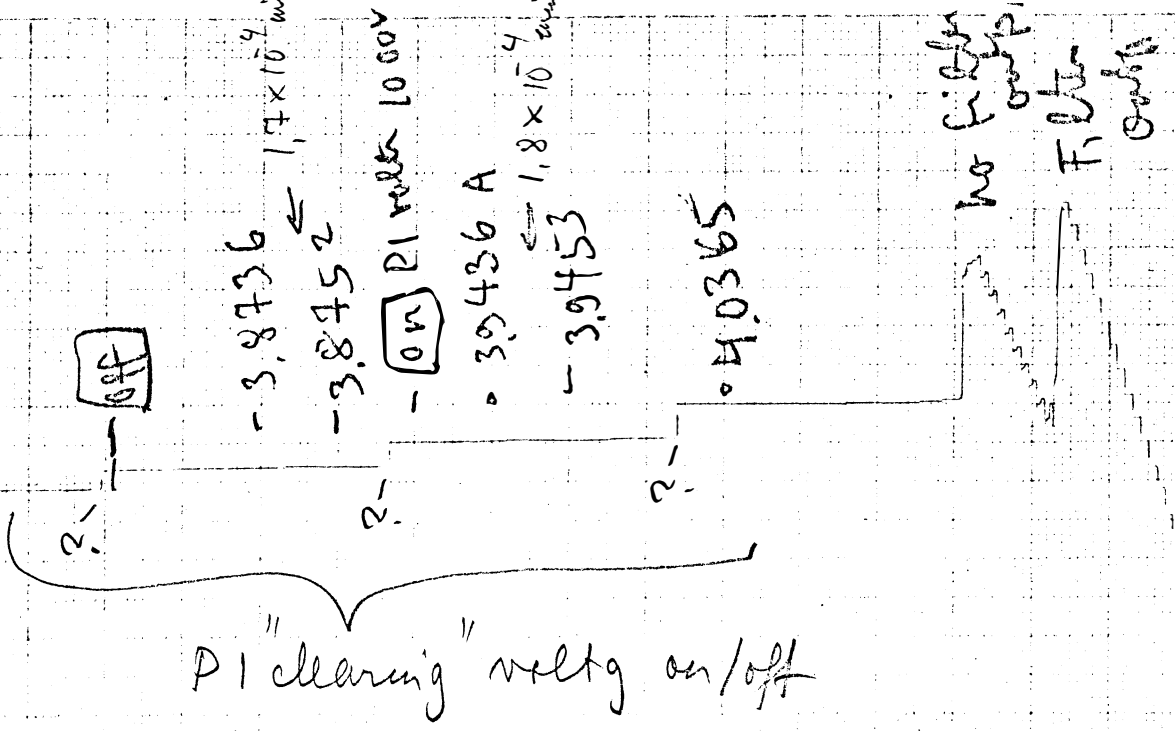
Filler  
outlet

Pressure in 517.7

Fig 4



23.8.17



Pressure 517.7

Fig 5

41  
69  
a

10-9  
am

10-8

10-7

10

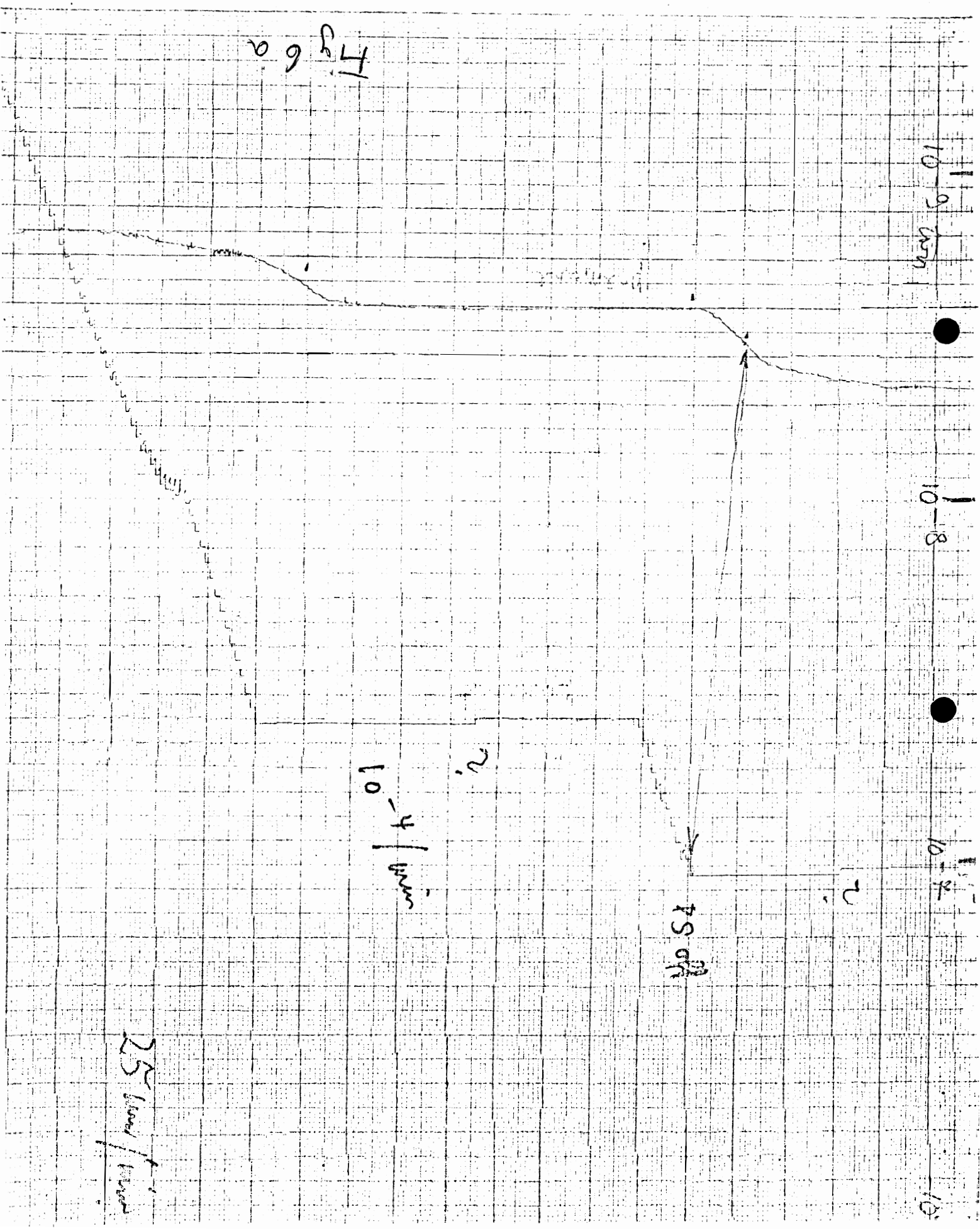
25  
m  
/

10-4  
/

75  
am

2

2





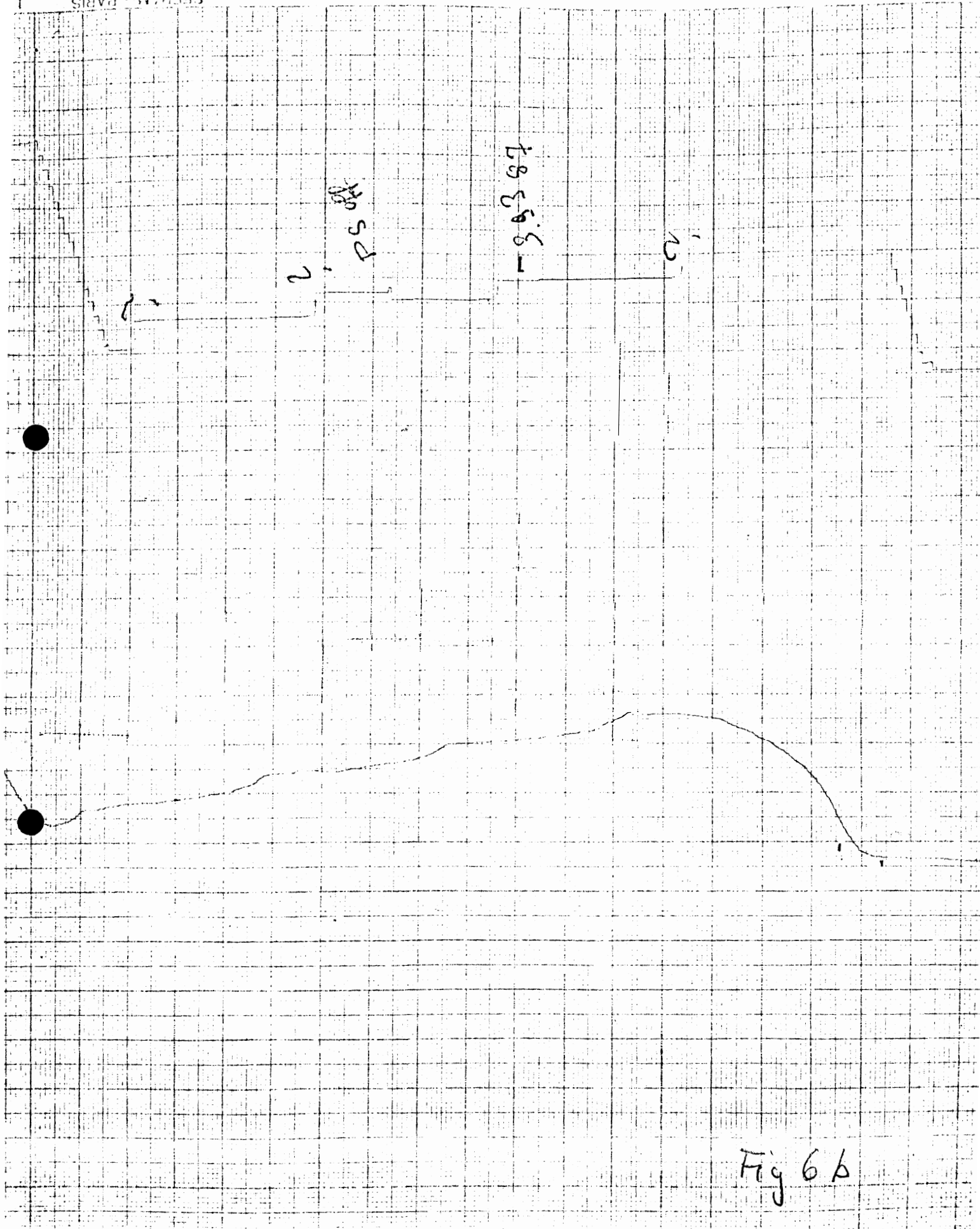


Fig 6b



Fig 6c

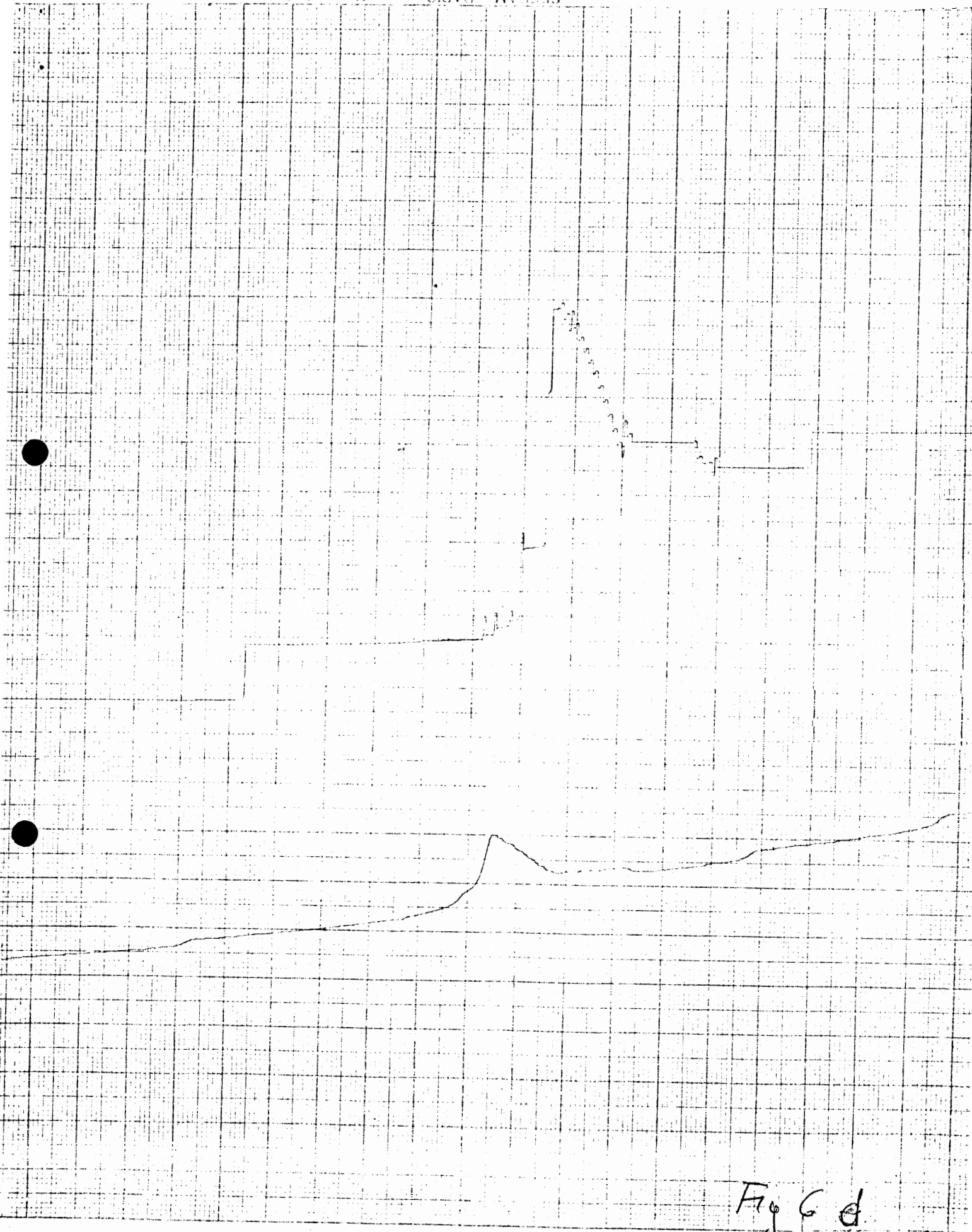


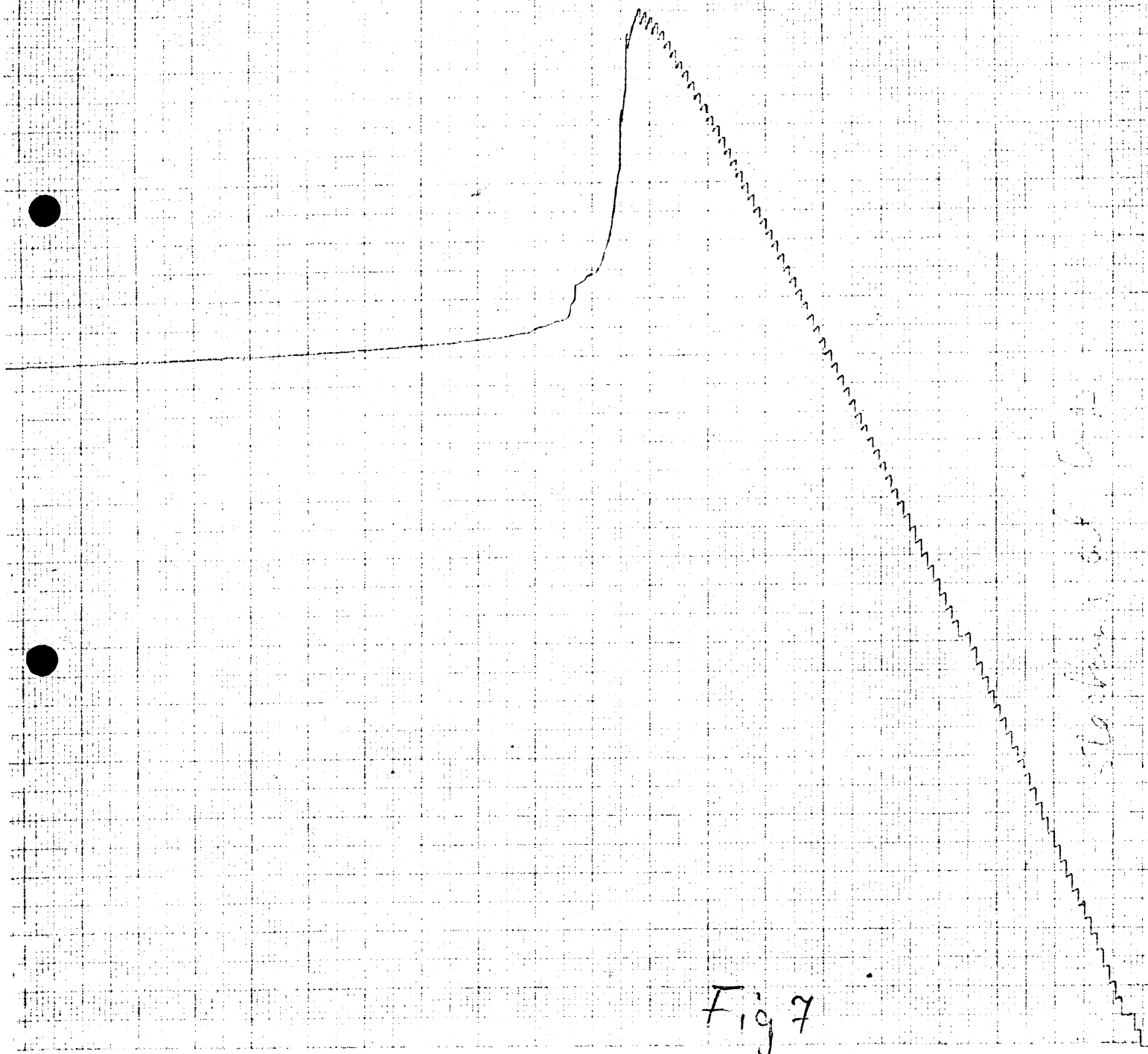
Fig 6 d

SAFS

FS 26 in RZ

stack at top

25 min / min



Stack at top

Fig 7