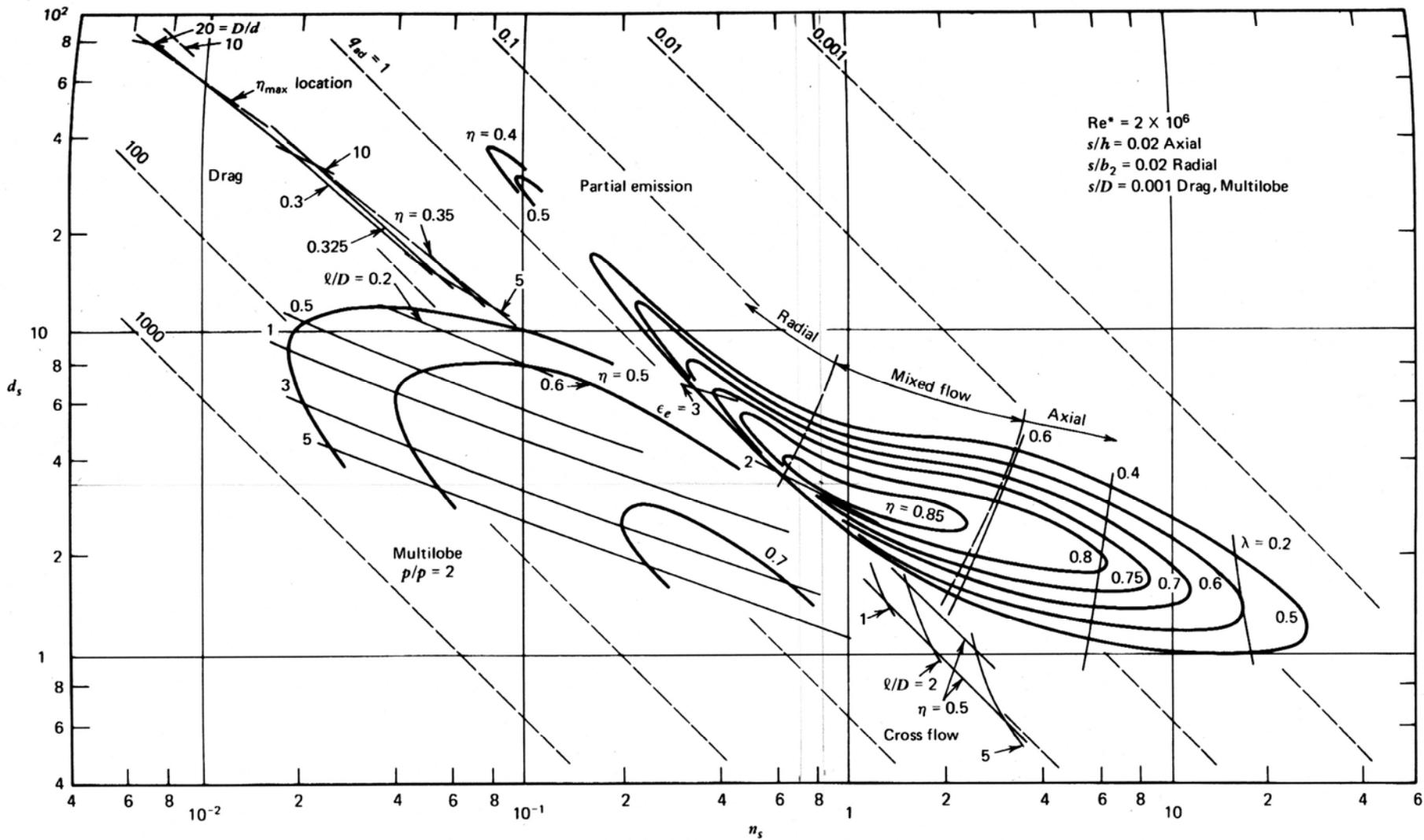
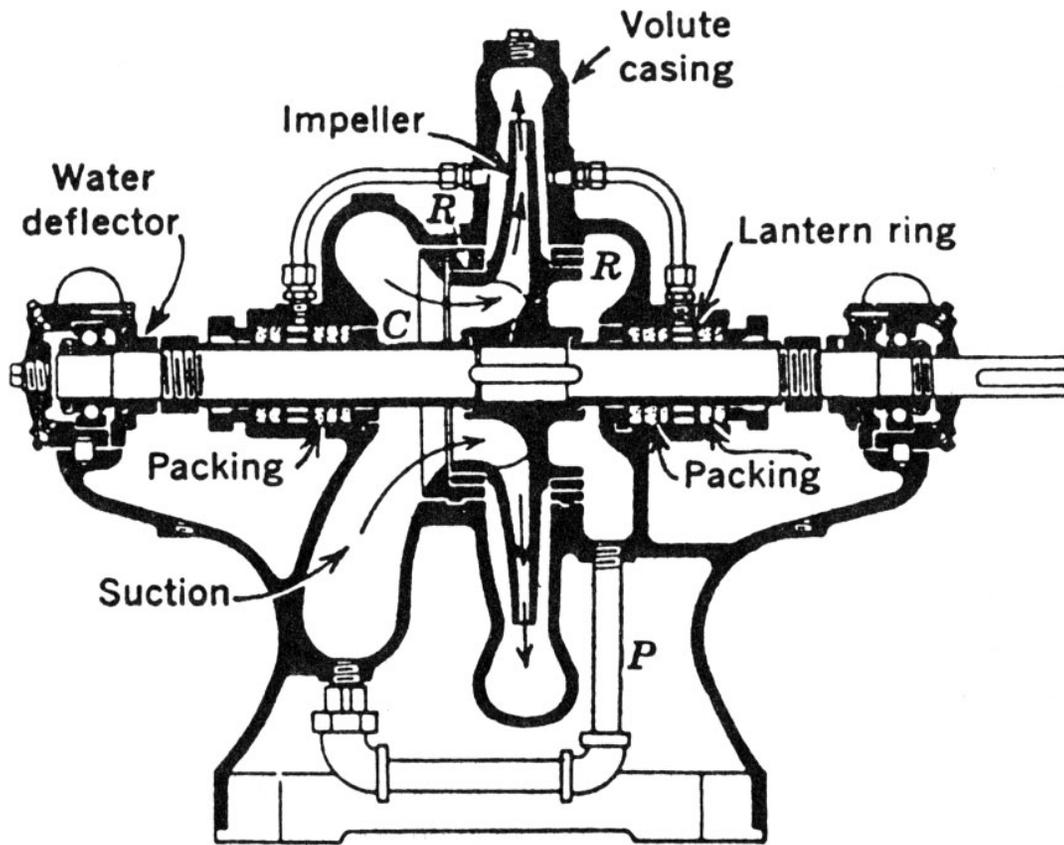


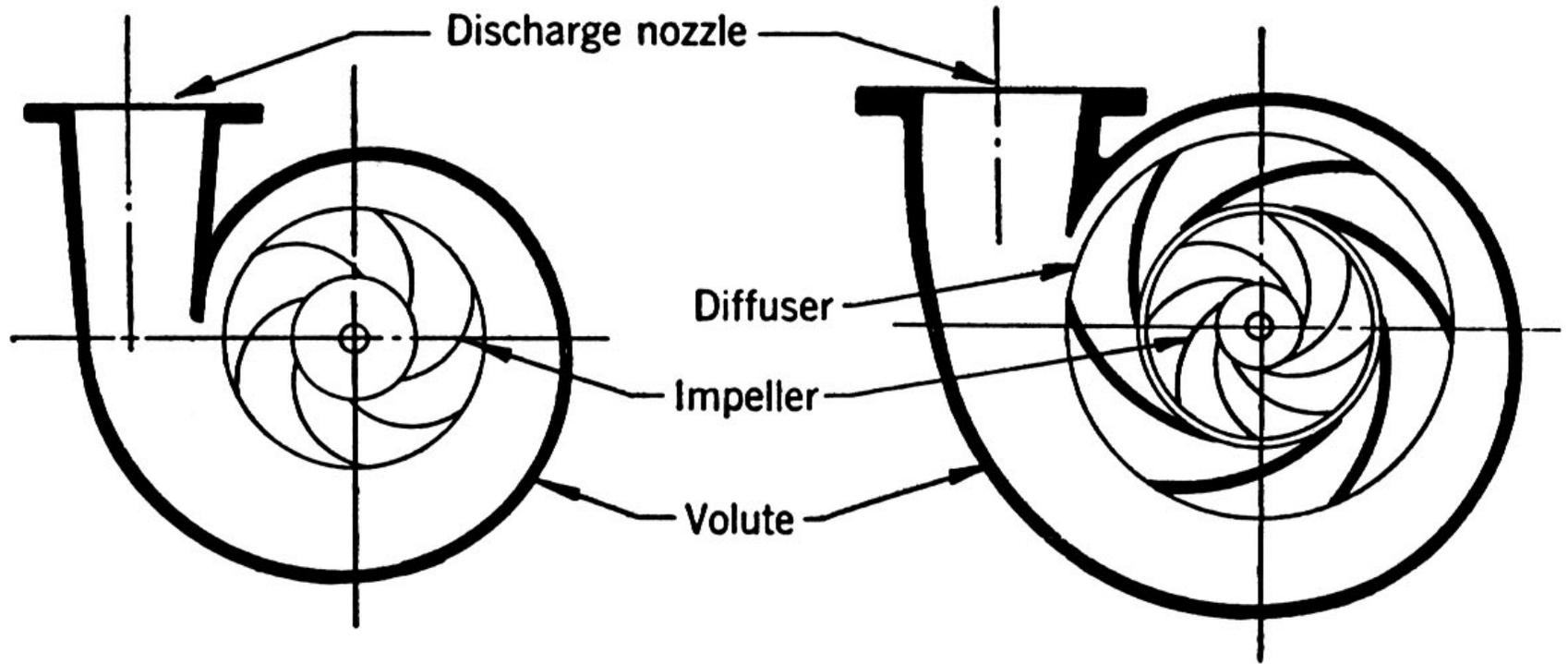
*Lezione*

Turbopompe centrifughe

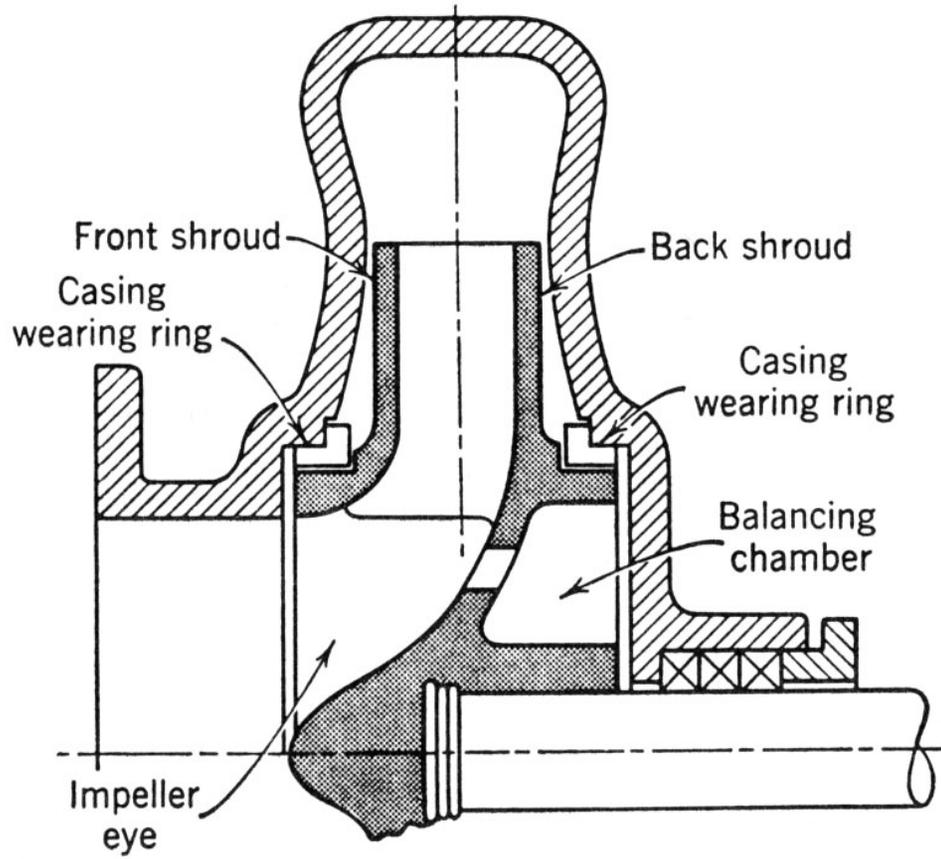




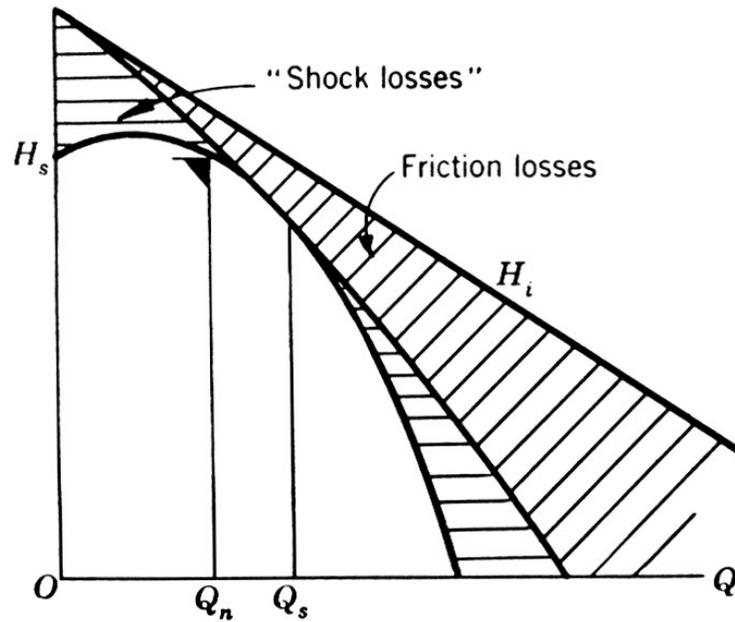
Single-suction pump.



Volute and diffusion casing pumps.



Single-suction impeller with a balancing chamber on the back.



$Q$ - $H$  curve is obtained by subtraction of hydraulic losses from input head.

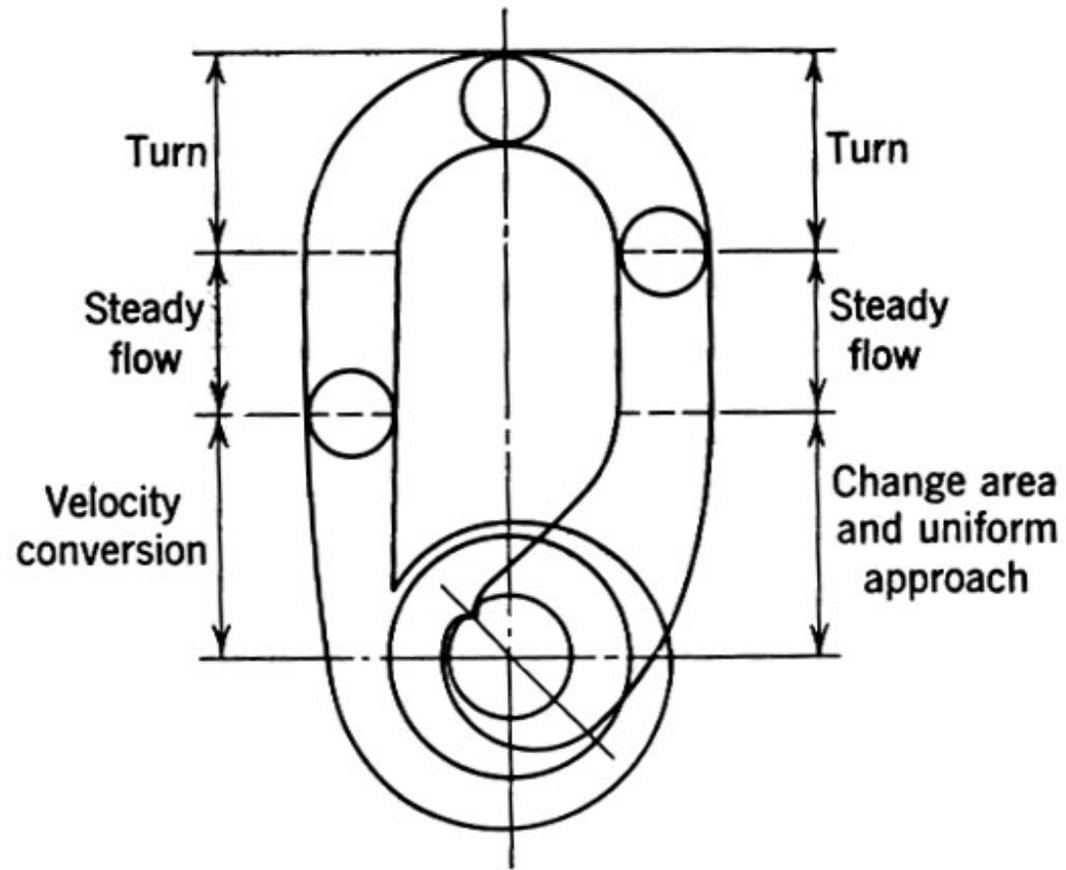
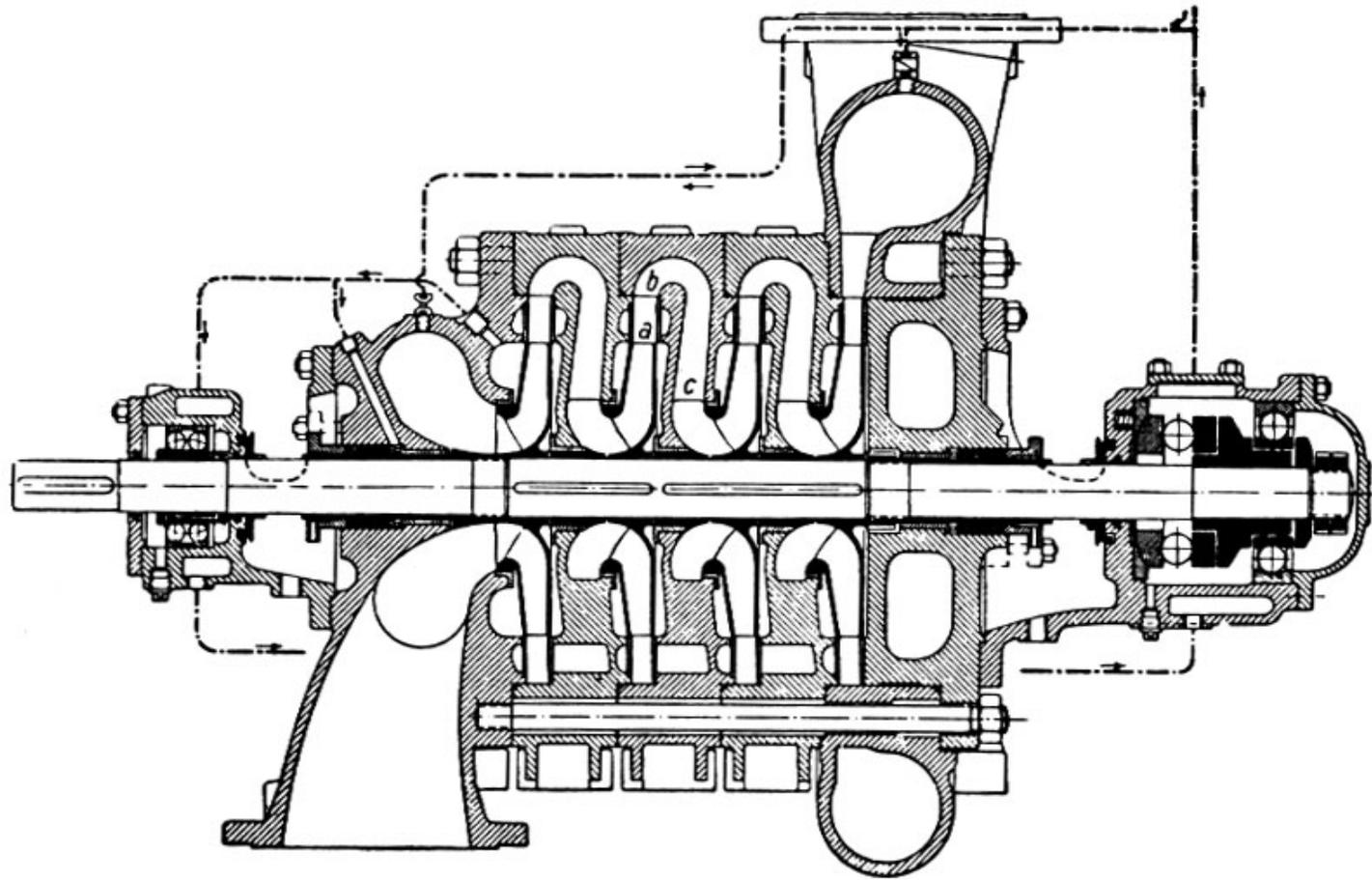
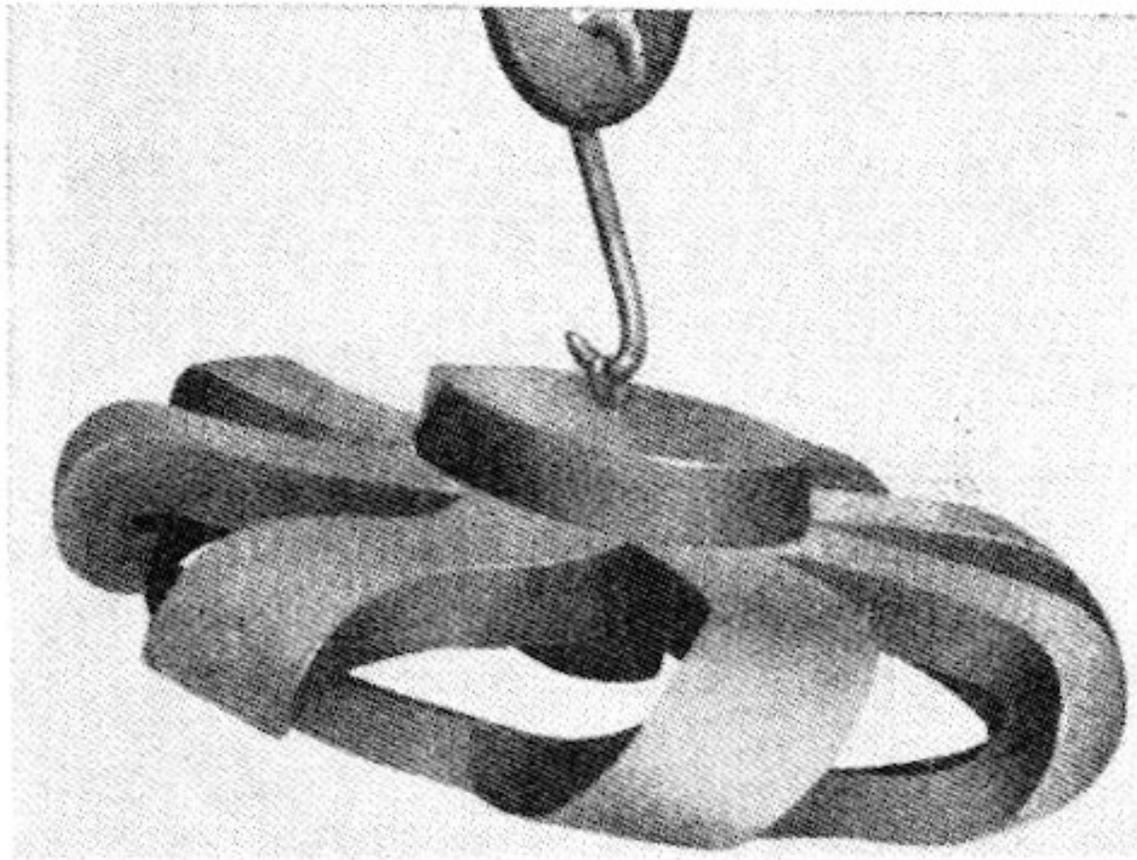


Diagram of a crossover.



Multistage pump with a continuous diffuser and return channel



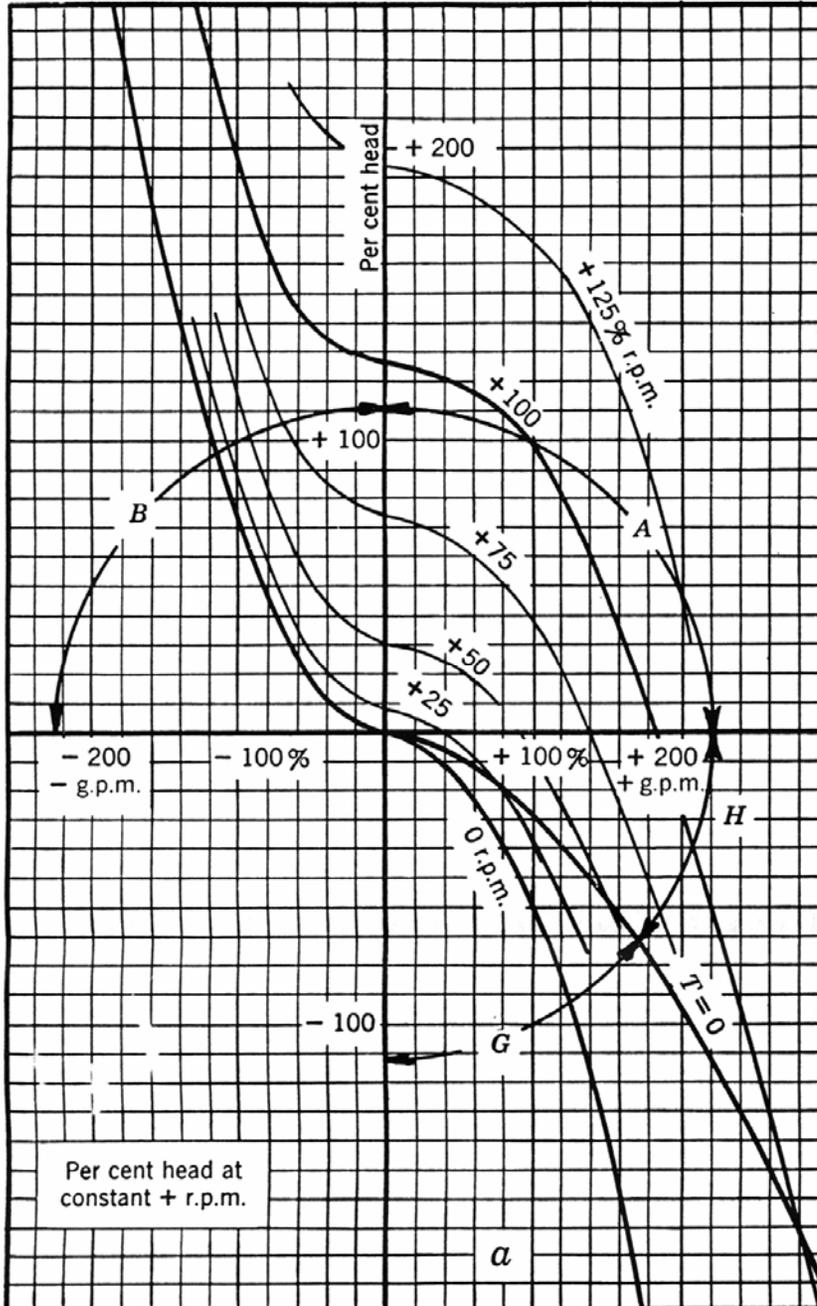
Corework of the diffuser and return channel of pump shown



# COMPLETE PUMP CHARACTERISTICS

BASED ON DATA BY R. T. KNAPP  
ASME TRANS. NOV. 1937

DOUBLE-SUCTION PUMP,  $n_s = 1800$



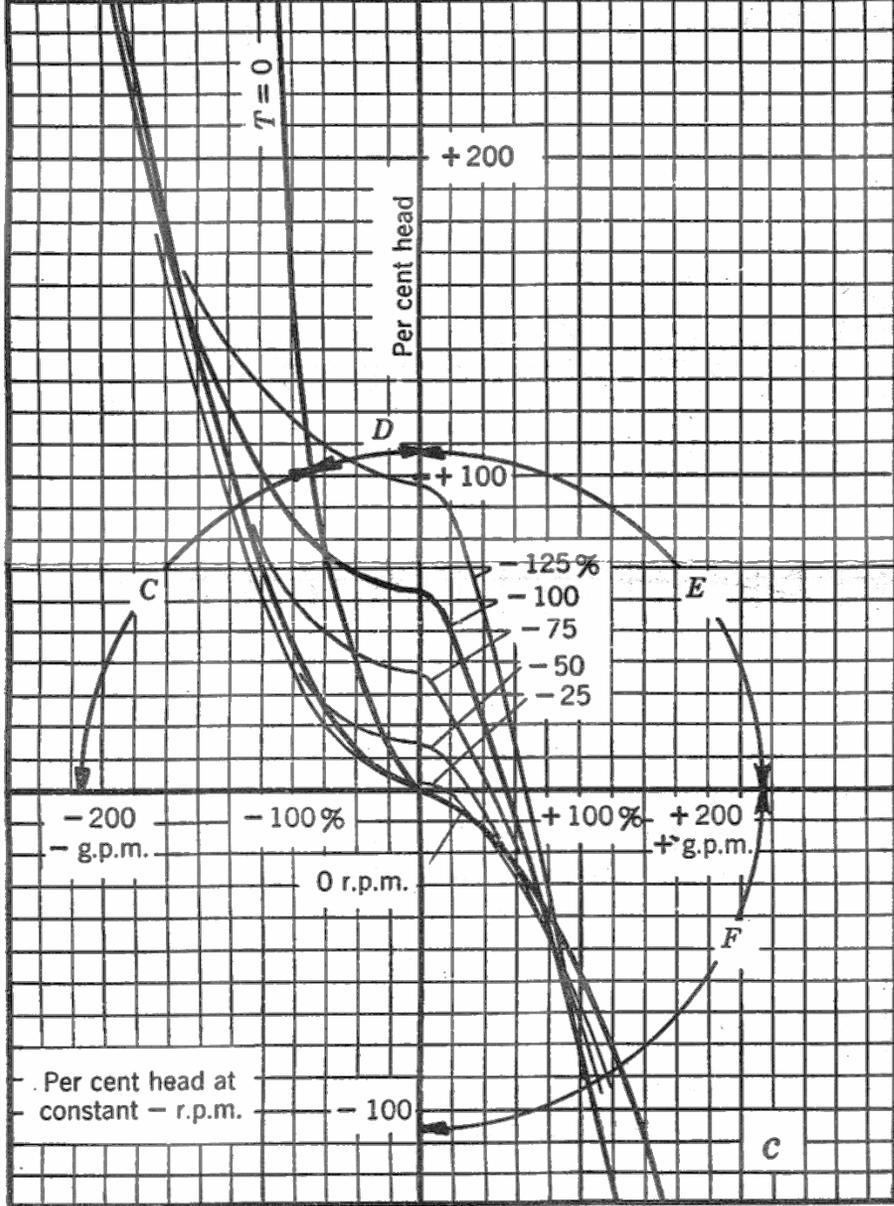
## Explanation of Terms

- A ----- Normal pump
- B ----- Energy dissipation
- C ----- Normal turbine
- D ----- Energy dissipation
- E ----- Reverse r.p.m. pump
- F ----- Energy dissipation
- G ----- Reverse flow turbine
- H ----- Energy dissipation
- + r.p.m. .... Normal pump
- r.p.m. .... Normal turbine
- + hp. .... Applied to shaft
- hp. .... Taken from shaft
- + T -----  $C \left( \frac{+hp.}{+r.p.m.} \right)$  or  $C \left( \frac{-hp.}{-r.p.m.} \right)$
- T -----  $C \left( \frac{+hp.}{-r.p.m.} \right)$  or  $C \left( \frac{-hp.}{+r.p.m.} \right)$

# COMPLETE PUMP CHARACTERISTICS

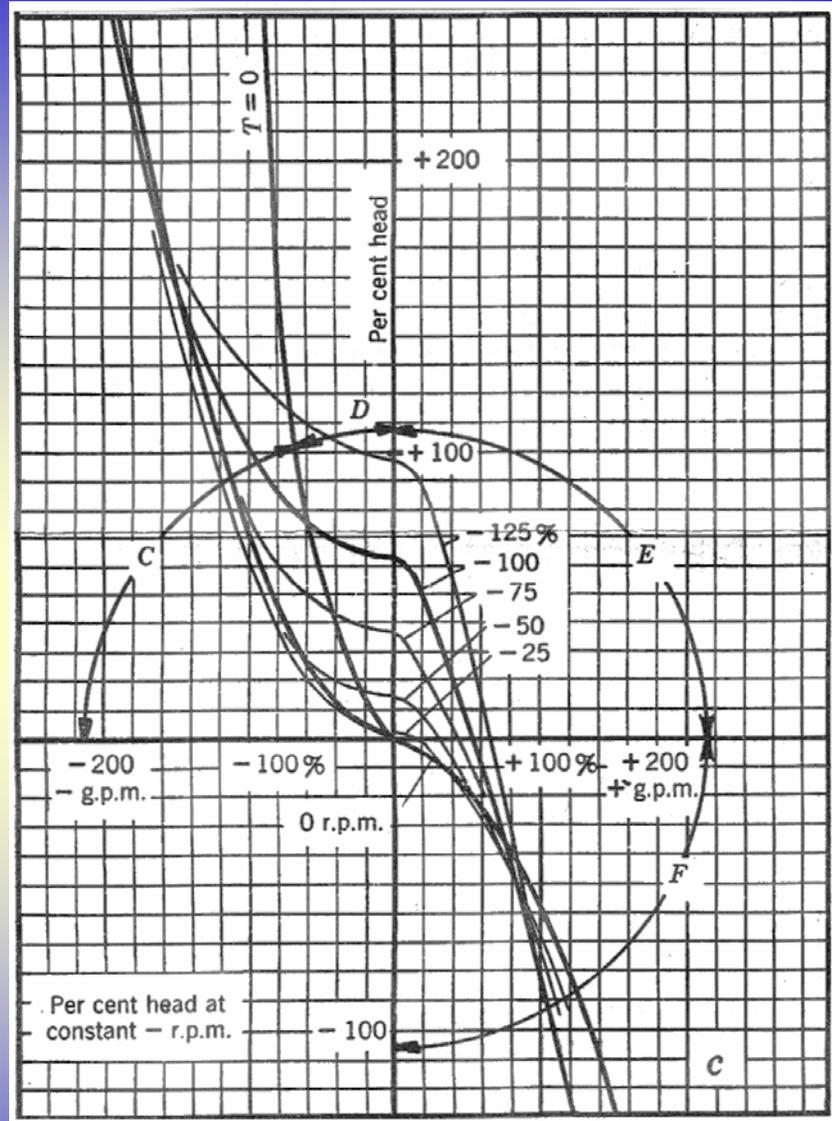
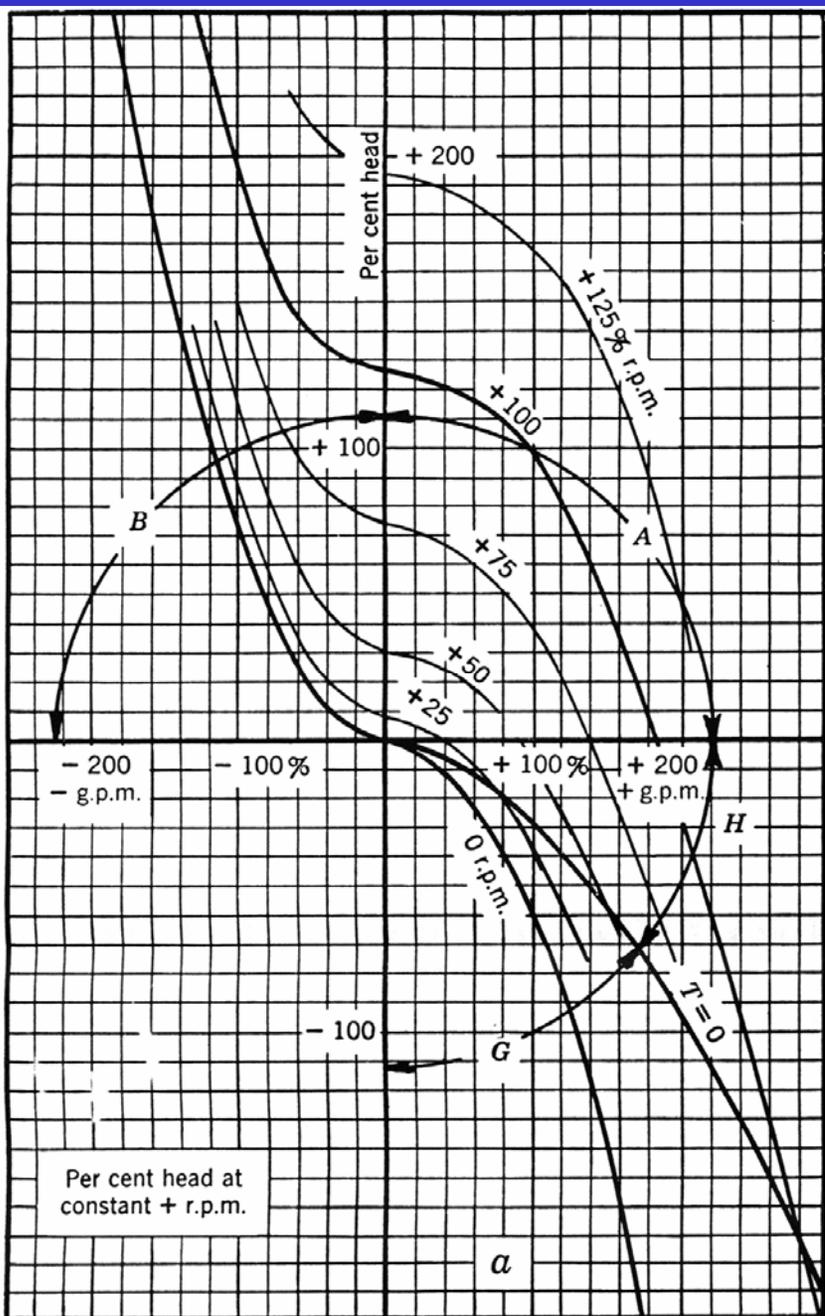
BASED ON DATA BY R. T. KNAPP  
ASME TRANS. NOV. 1937

DOUBLE-SUCTION PUMP,  $n_s = 1800$



## Explanation of Terms

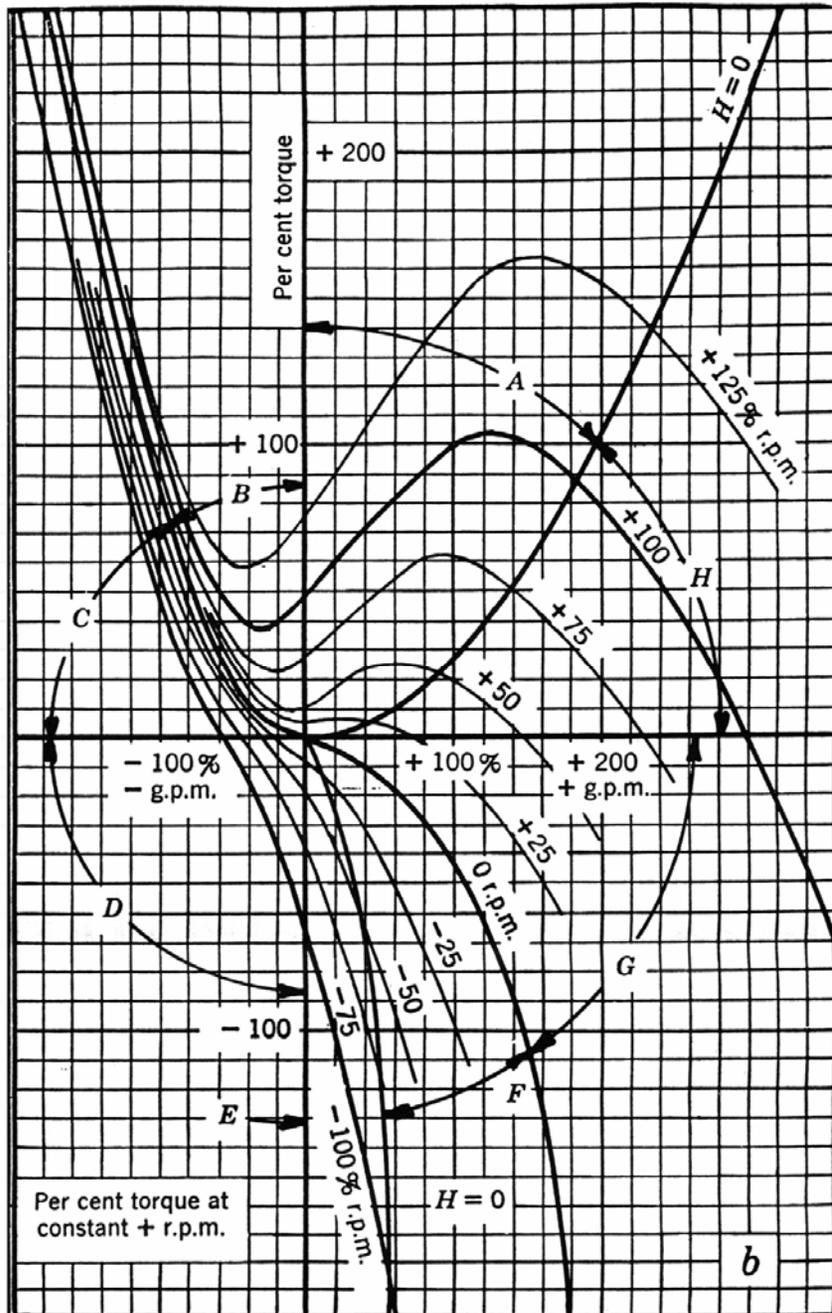
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# COMPLETE PUMP CHARACTERISTICS

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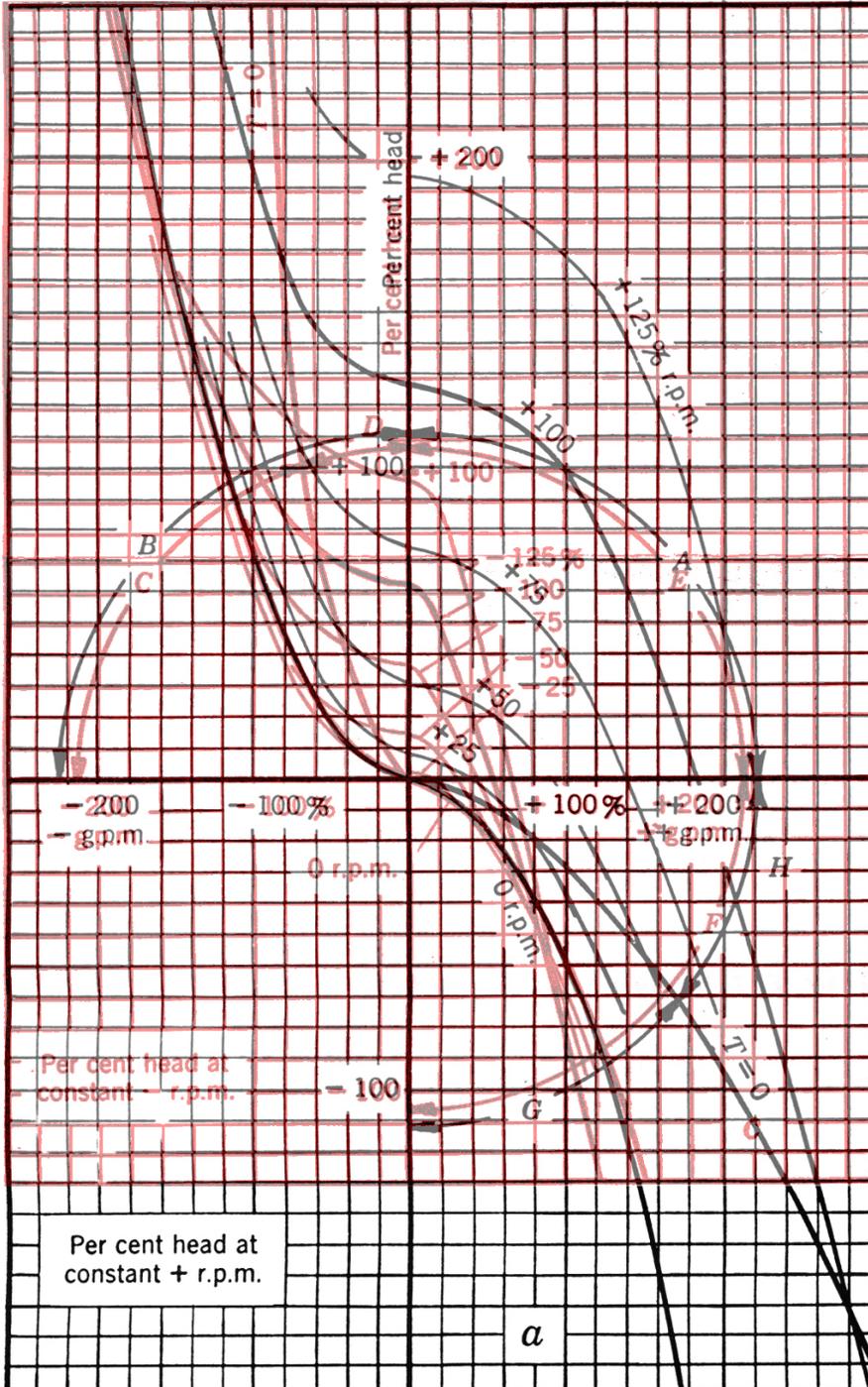
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- T -----  $C \left( \frac{+hp.}{-r.p.m.} \right)$  or  $C \left( \frac{-hp.}{+r.p.m.} \right)$

Per cent head at constant + r.p.m.

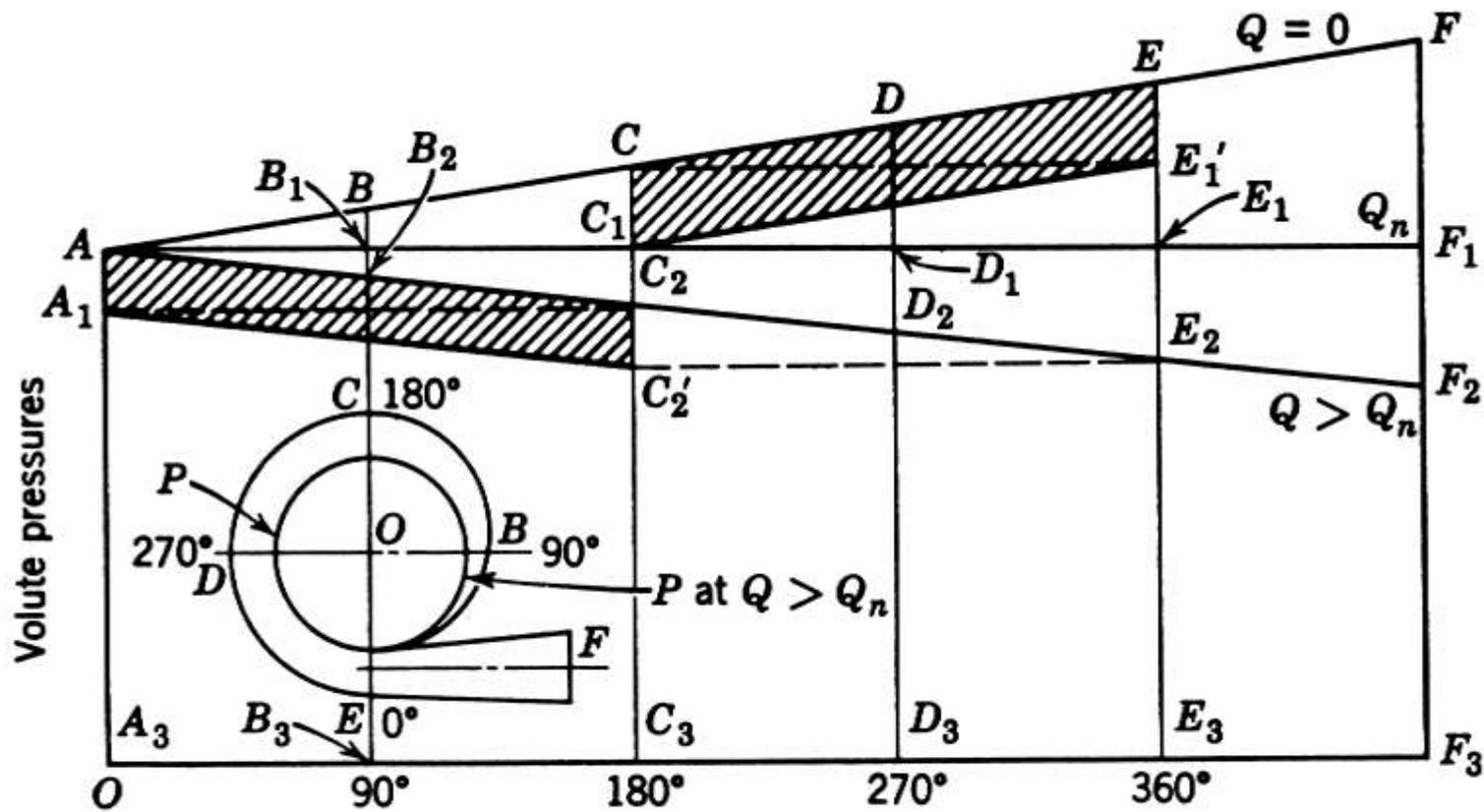


FIG. 7.11. Energy gradient and radial thrust in a single-volute casing.