The SPIRAL

COMPOSITION BOOK

MARGINAL RULED

No. 841-S

WESTAB

Made Under One or More of The Following U. S. Patents
2188680-2051477-1985776 and Other U. S. Patents Issued.

Page 1

Eötvös Lobe

Aug. 22nd 1946

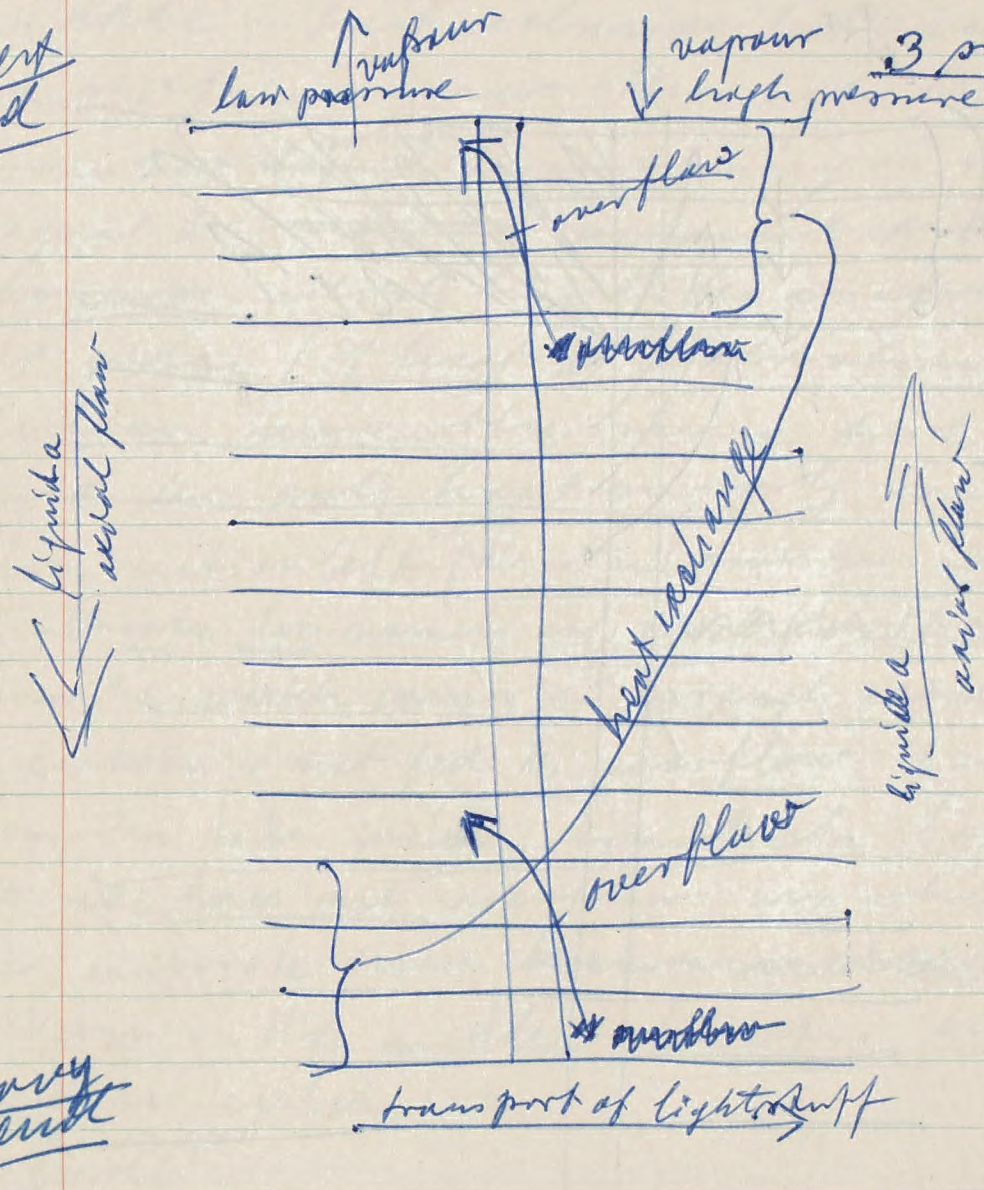
Two-solvent method for separation

light end

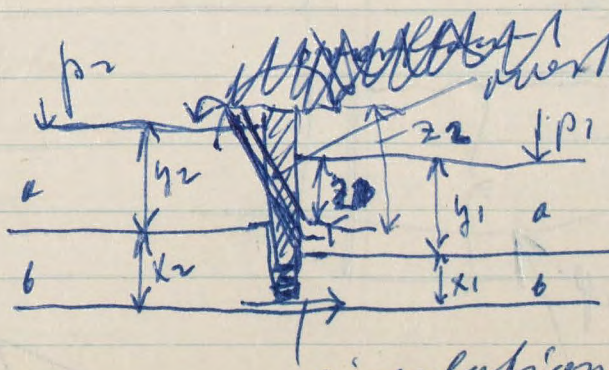
vapour low pressure

vapour high pressure

3 subdivisions in this example



heavy end



$p_1 + z_1 s_a = p_2 + z_2 s_a$

$p_1 + y_1 s_a + x_1 s_b =$

$= p_2 + y_2 s_a + x_2 s_b$

$x_1 + x_2 = \text{fixed}$

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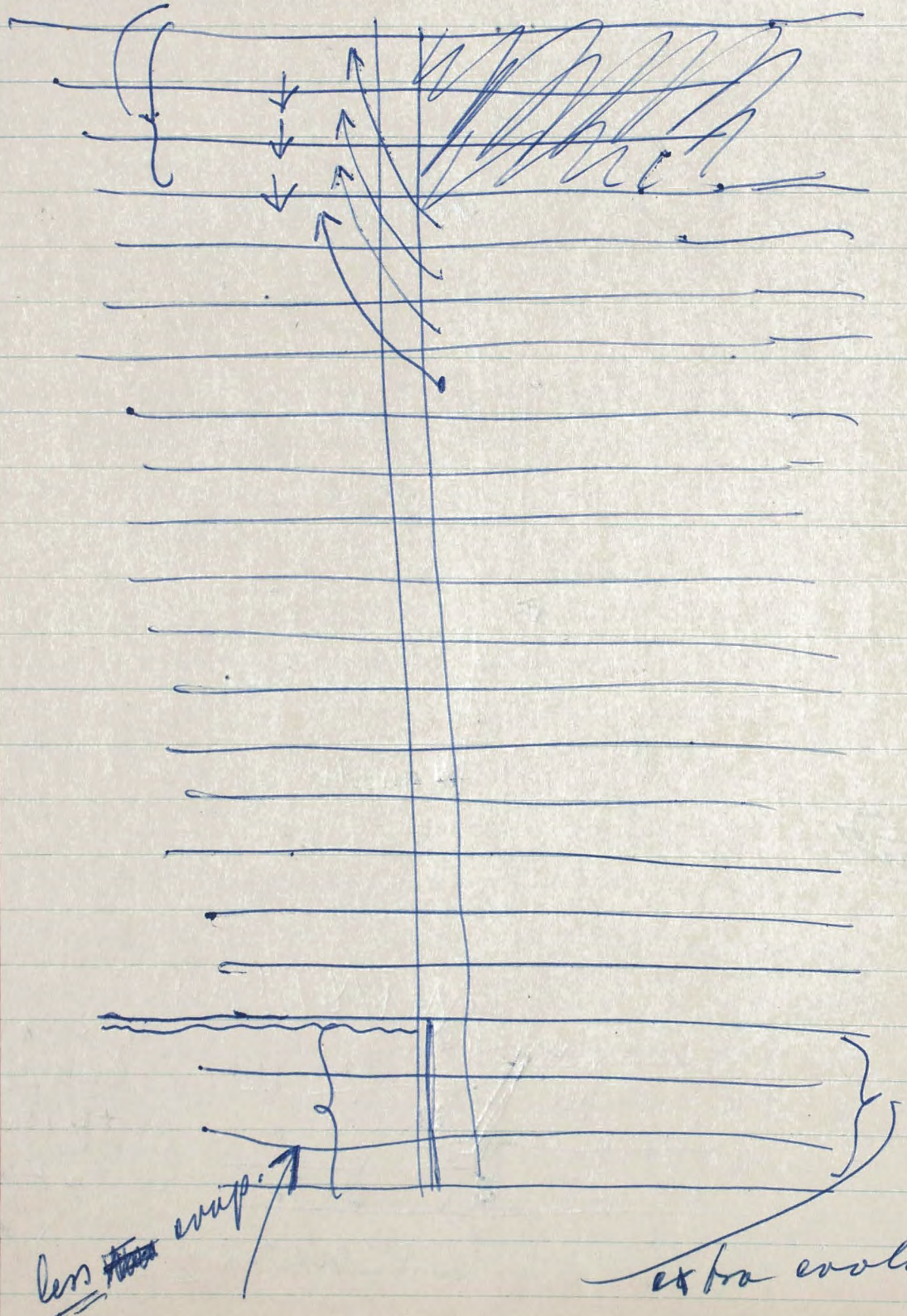
Is this good?

extra heating



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Page 2

Physiology of a partition in the middle: heat exchange between left and right container through liquid 6. amount of ~~liquid~~ solvent a condensing on right side is equal to ~~amount~~ amount of solvent a ~~to be said~~ which has to be evaporated on left side (if heat of evaporation from solution were the same heat by exchange would be only heat supply needed.) Bottom section left side (three subdivisions shown) has to evaporate less namely any ~~axial flow dilute~~ amount of solvents which comes in through axial flow since this section is not fed by overflow therefore this section has to be cooled. Similarly top section right side does not overflow any where and has to evaporate more ~~than any other~~. than a partition in the middle therefore this section has to be heated. —

No graph!

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Page 5 Aug 23/46

enters by push

$d\, p(k-1)$; $d\, q(k-1)$

leaves by push

$d\, p(k)$; ~~[illegible]~~ $d\, q(k)$

$p(k+1) = p(k)(1+\beta)$

$q(k-1) = q(k)(1-\beta)$

leaves / incoming

$p(k) + d\, p(k) = p(k)(1+d\beta) + d\, p(k)(1-\beta)$

$(1+d)\, p(k) = p(k) + d\, p(k) + p_k d\beta - d p_k \beta$

OK balances; trivial

---

leaves / enters

$(1+\alpha)\, q_k + d\, q(k) = (1+\alpha)\, q(k)(1-d\beta^{?}) + d\, q(1+\alpha)$

~~$(d+1) q_k + \alpha q_k = q_k(-d+1)\, \alpha\, q(k) - \alpha d\beta q_k$~~

$- q(k)\, d\beta + \alpha\, q(k)$

$\alpha\, d\, q(k)$

$\alpha = \alpha - d\beta + \alpha d$

$d\beta = \alpha d$

mistake

no good

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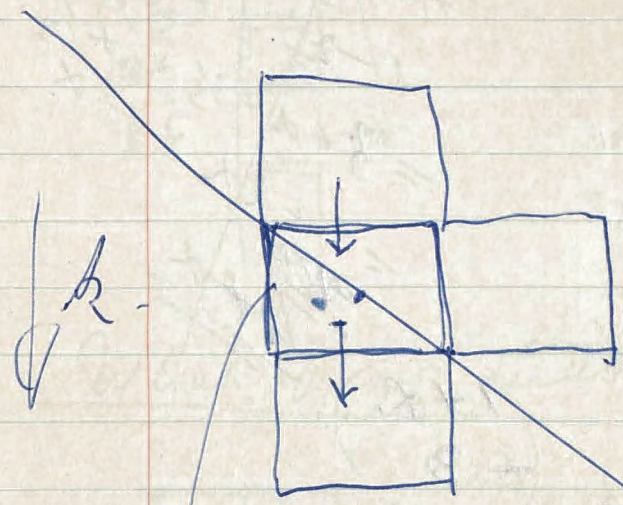
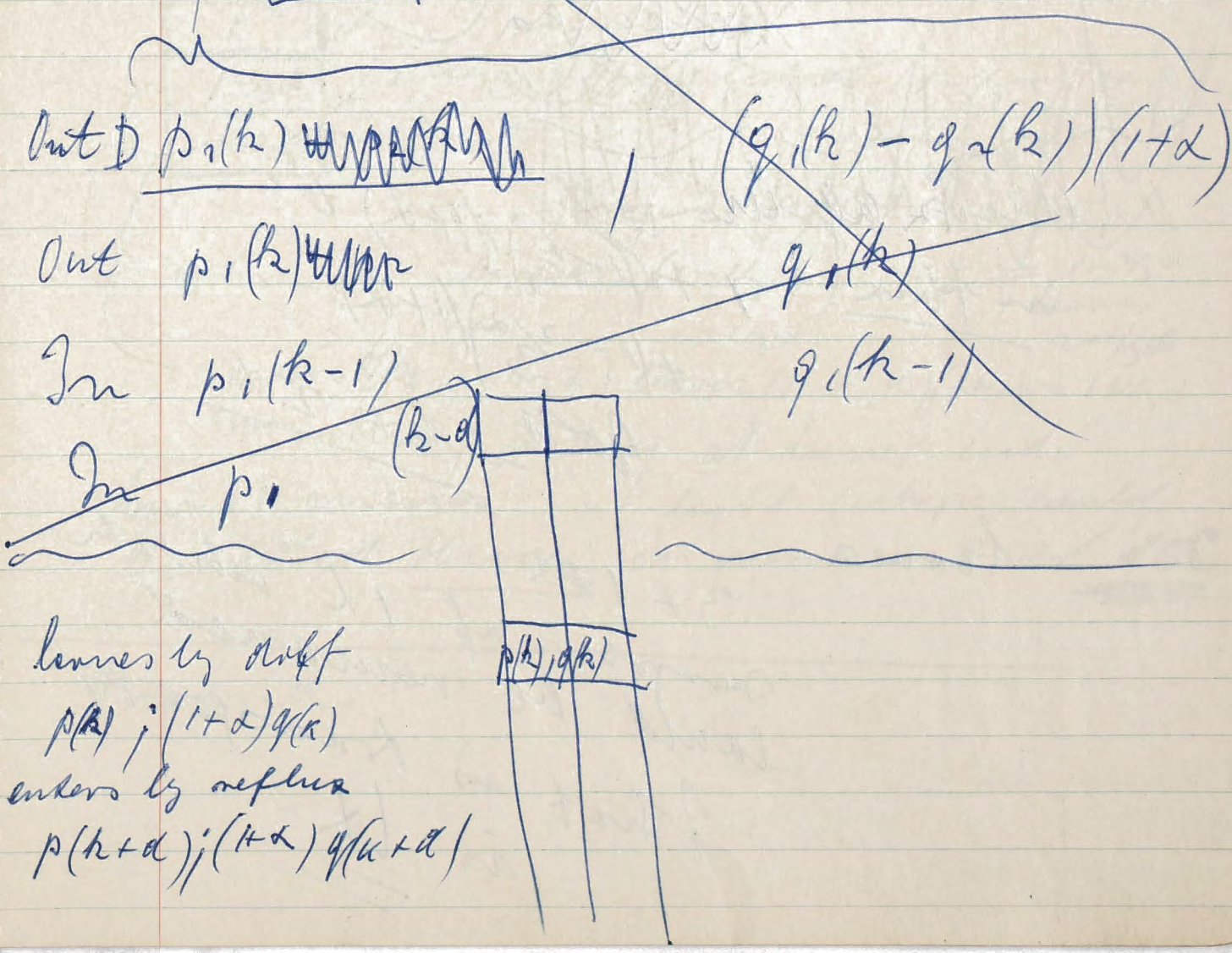
Prop 4

Theory of prop 3 in stationary state

Let ratio of concentration left to right be n that is $p_1 + q_1 = n(p_2 + q_2)$





leaves by drift
$p(k) ; (1+\alpha) q(k)$
enters by reflux
$p(k+\alpha) ; (1+\alpha) q(k+\alpha)$

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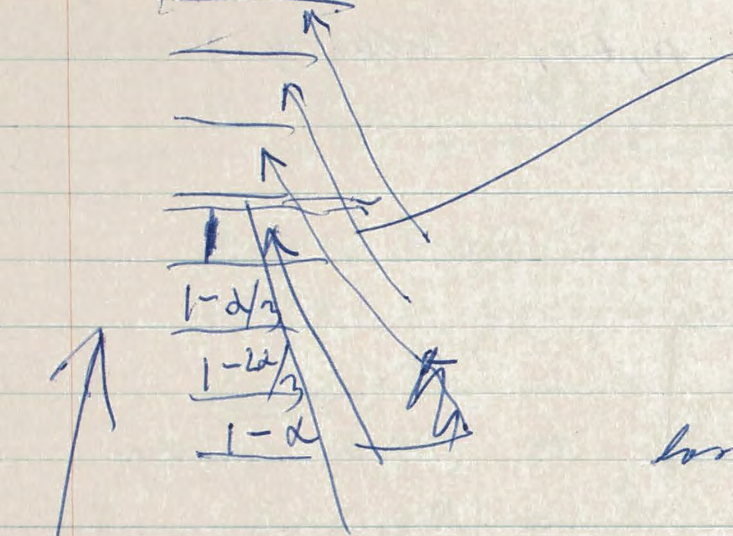
Top end check



~~influx~~
~~$(1+\alpha)$~~
~~$+(1-\frac{\alpha}{3})(1+\alpha)$~~
~~$+(1-\frac{2\alpha}{3})(1+\alpha) =$~~
~~$= 3+\alpha+\frac{2}{3}\alpha+\frac{1}{3}\alpha$~~
~~$= 3+2\alpha+1-\alpha$~~
~~$= 3+4+\alpha$~~

loss

$1+\alpha$
$+3$

check again

in flux

$1+\alpha$
$+(1-\frac{\alpha}{3})(1+\alpha)+$
$+(1-\frac{2}{3}\alpha)(1+\alpha)$
$= 4+2\alpha$

leaves

$3+1+\alpha$

surplus of 1α which could be renamed that is transport is 1α

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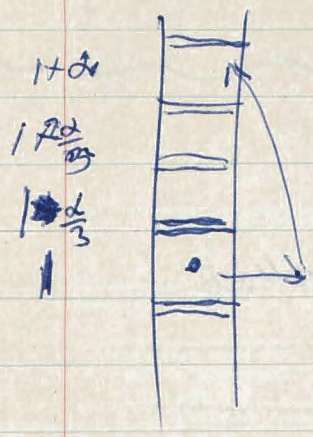
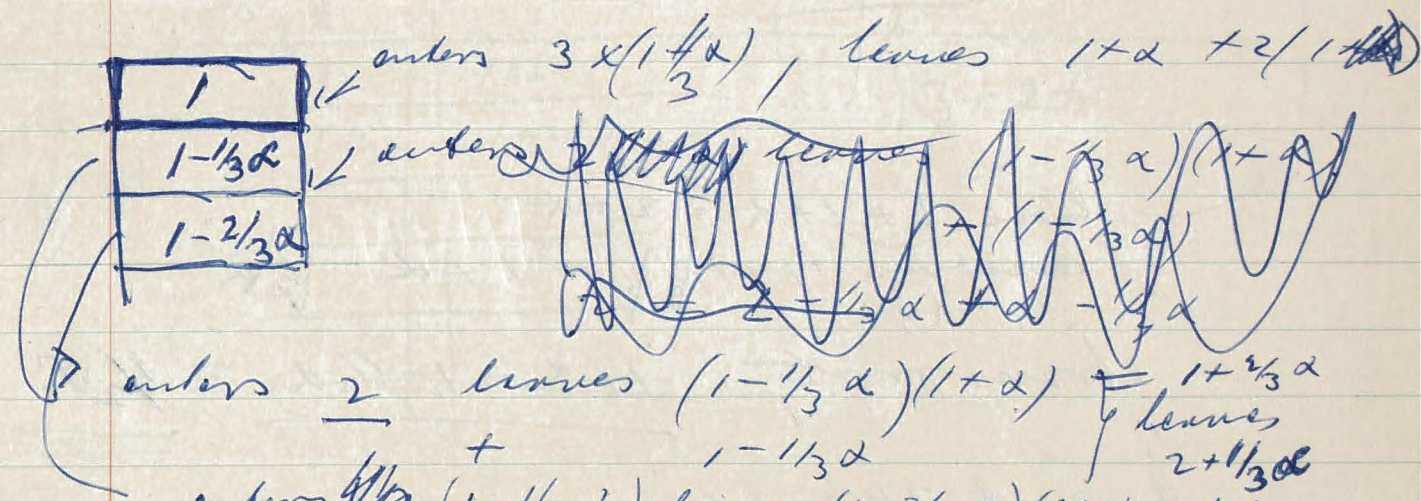


1+α leaves
3 × 1+α/3 enters
3 × 1 leaves

What about ends



something wrong at lower end
but it means light in hope could be added there in amount of 1α

Top end

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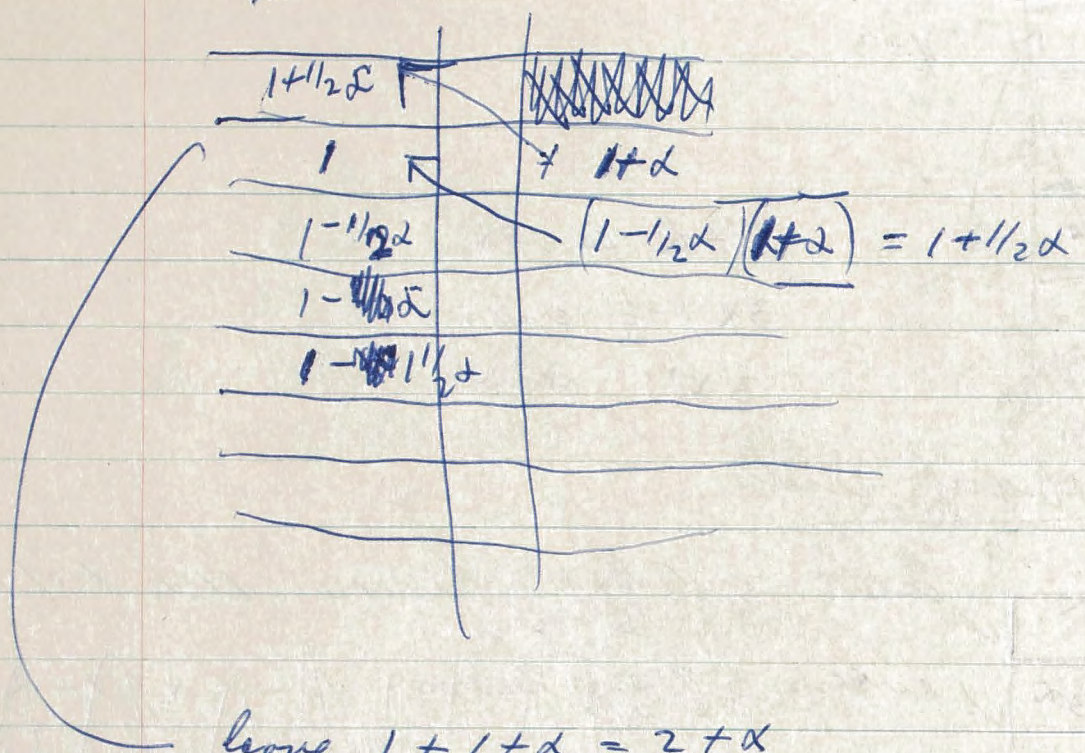
Try $\alpha = 1$

but same distribution along column



leave $1 + 1 + \alpha = 2 + \alpha$

receives $1 + 1/2\alpha + 1 + \alpha - 1/2\alpha$

transport $1 + \alpha - 1 - 1/2\alpha = \underline{1/2\alpha}$

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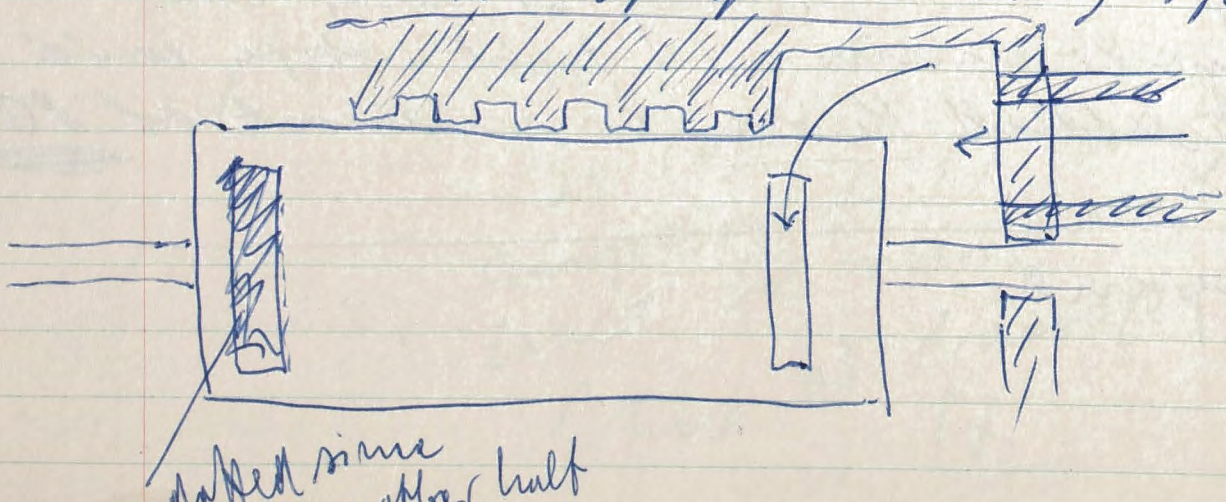
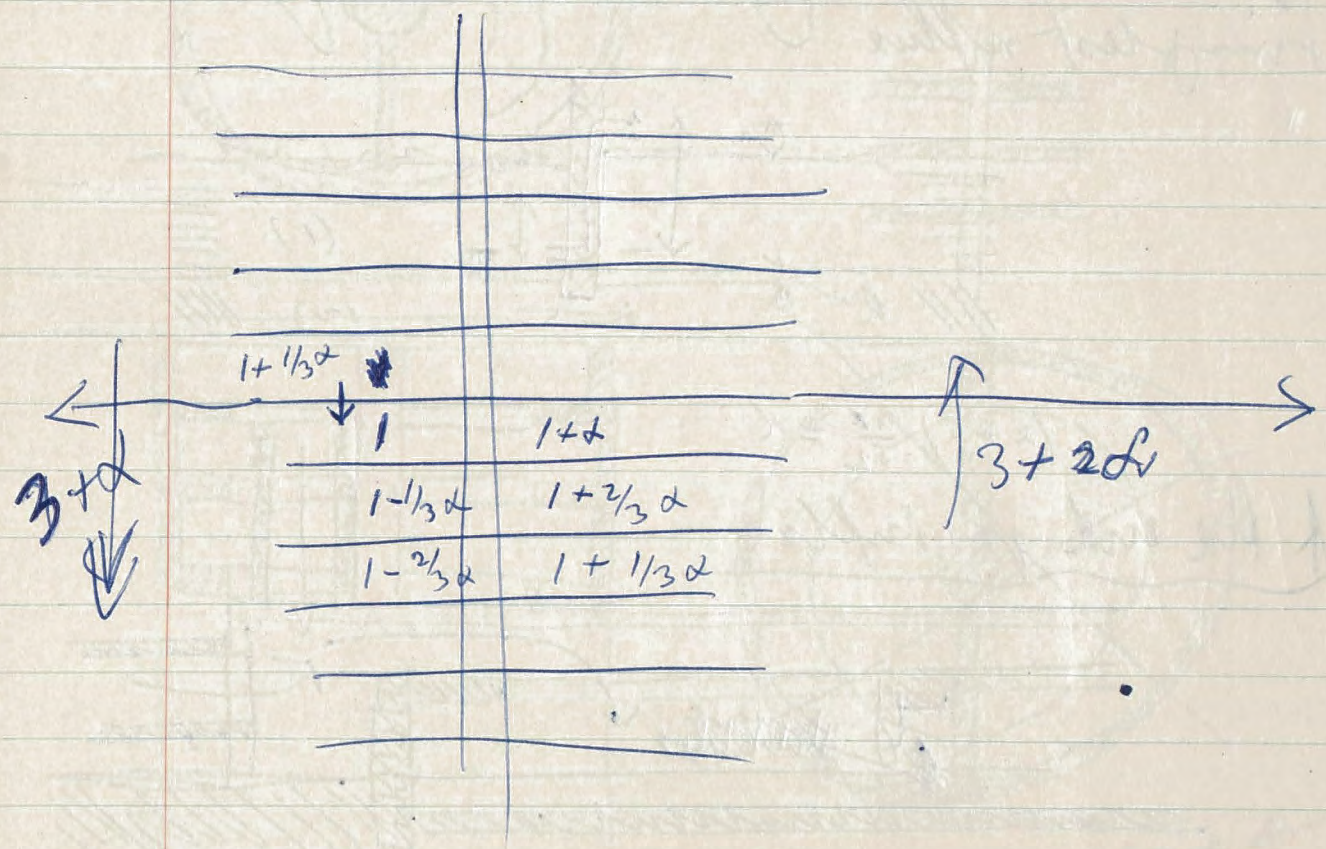
Introduction of gas in wing system



dotted since on other half

Check transport in middle



in each period transport is α whereas change from section to section is only $\frac{1}{3}\alpha$ or $\frac{1}{d}\alpha$. This is practically no transport. Perhaps better to drop consideration of reflux composition identified with composition of boundary

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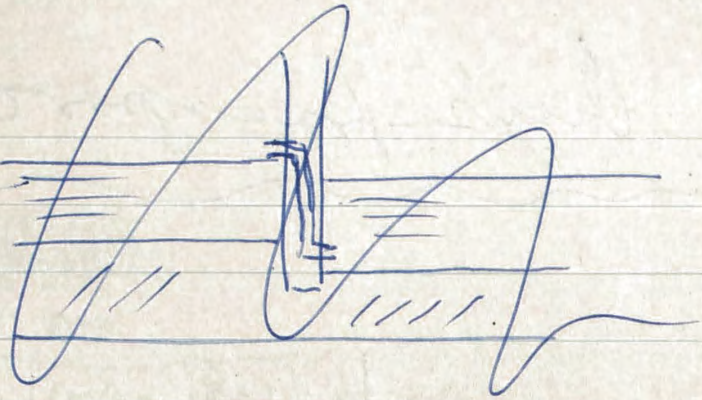
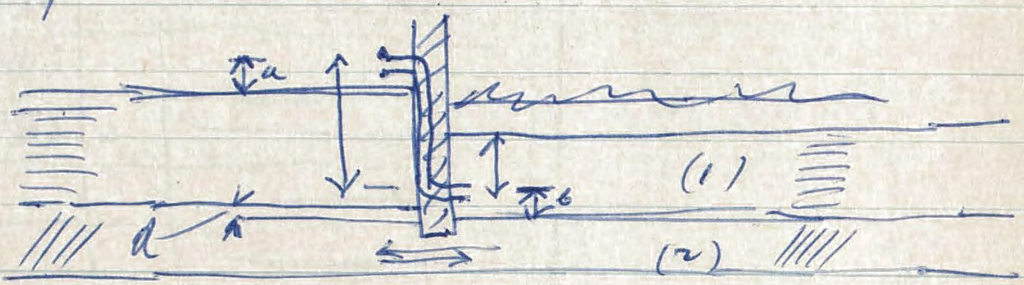
Hydrostatisk

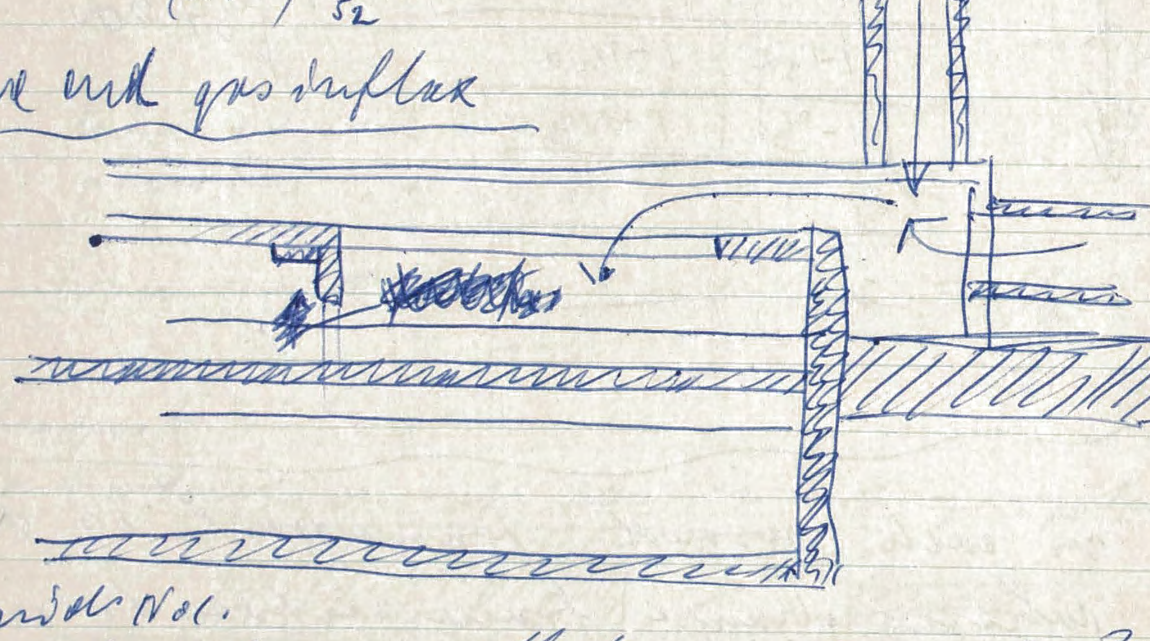


Stringlest reflux



$$(a+b)\frac{s_1}{s_2} = d$$

At the end gas reflux



Lagrindal Nol.
How should one withdraw at ends?
Feed in the middle no problem
Withdrawing possible, during rotation through axis if high pressure applied. intermittently. Perhaps another method would call for equalizing pressure and slowing down, then pump through

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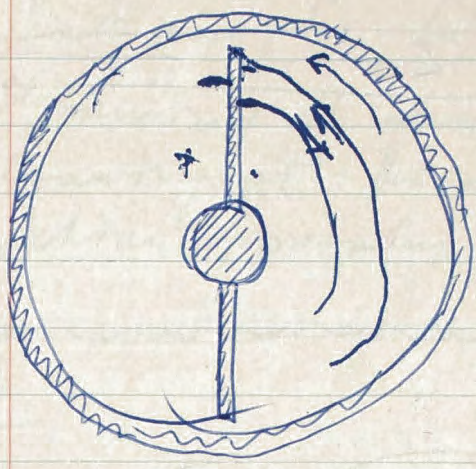
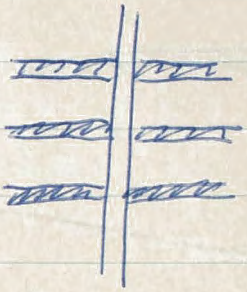
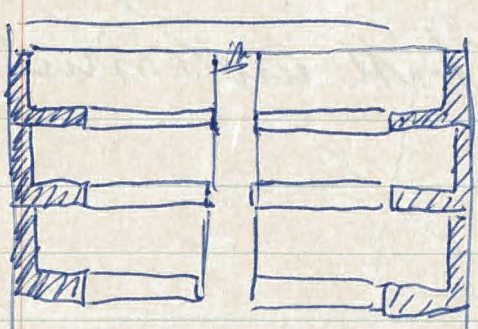
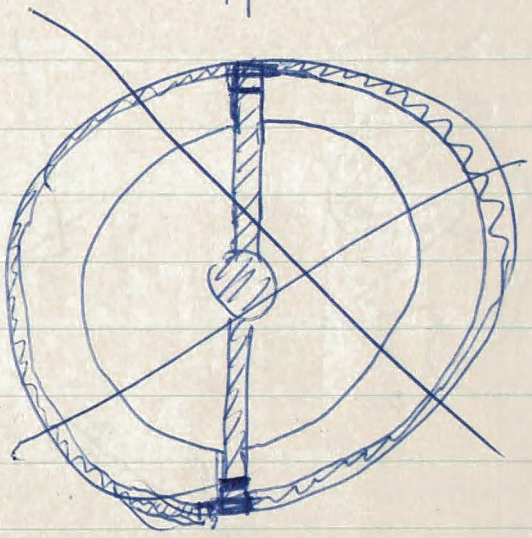
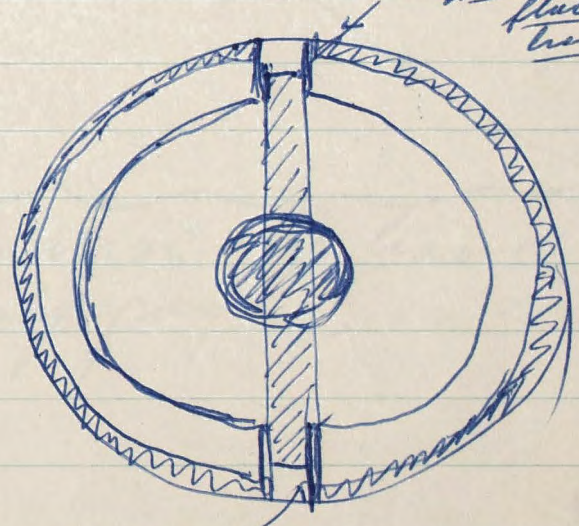




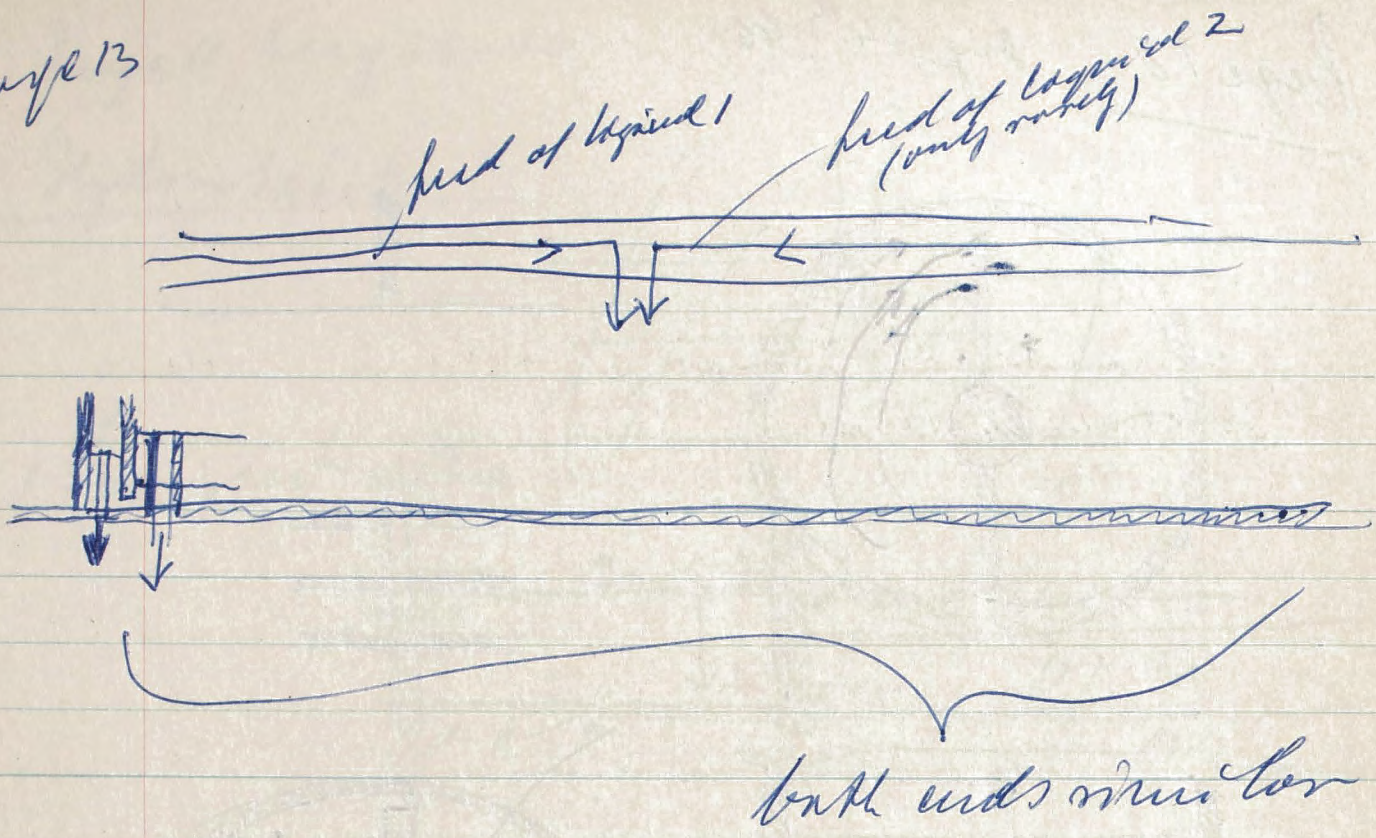




Space for axial flow here



Is this not too much space for axial flow? ; remedy see page 14


head of liquid 1
head of liquid 2
(only variable)
both ends submerged

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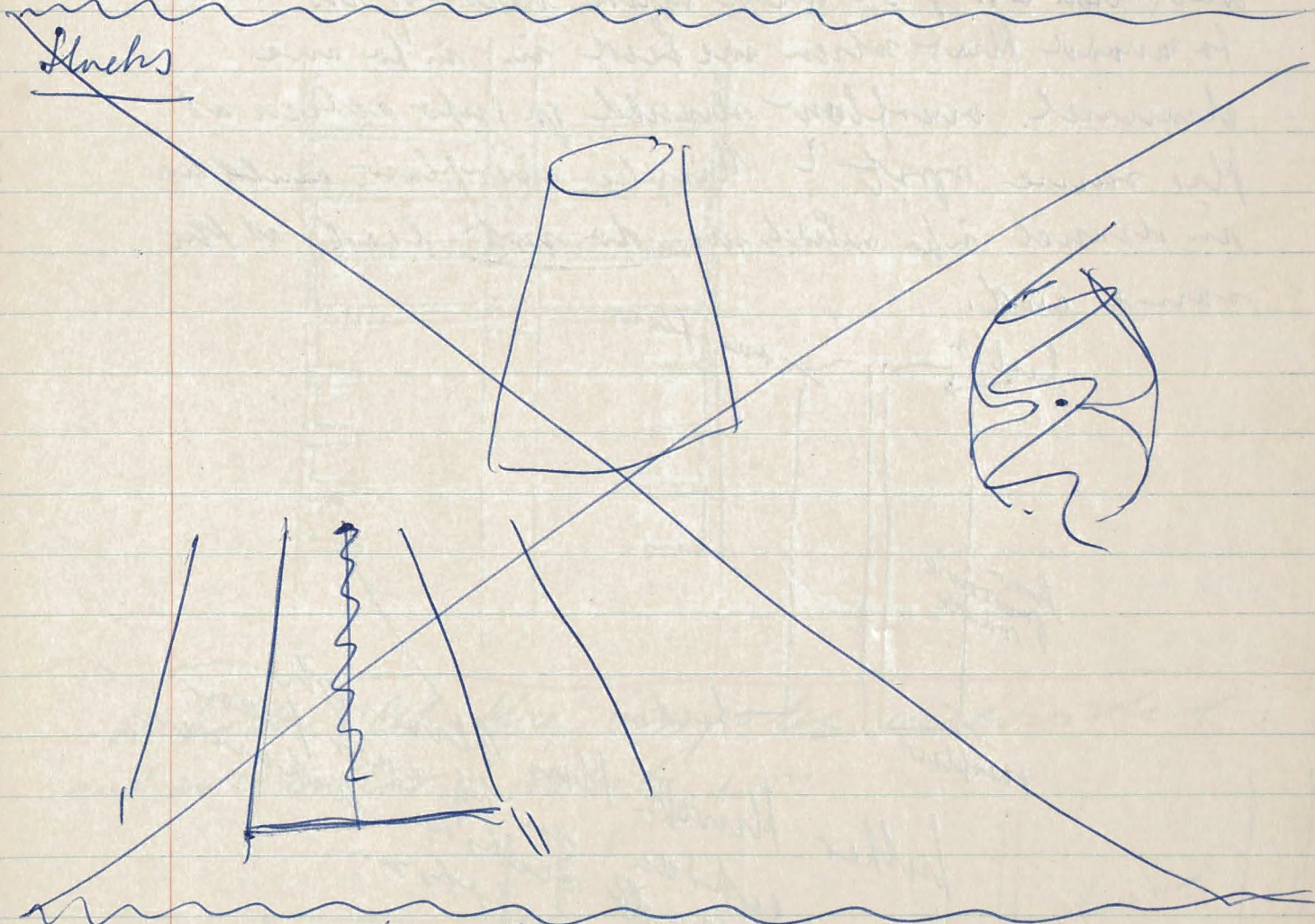
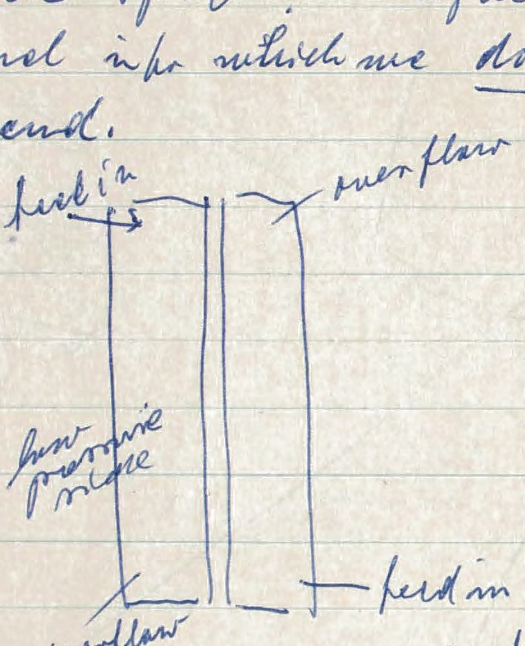
But may be by feeding in middle with drawing of equal amounts at both ends by drawing out pendulum (like the required Parabolic apparatus)

Sketch



Adopting this last solution we have as follows (see drawing page 13

How to make circulation?
perhaps by withdrawing at [bottle] ends from ~~one~~ one channels and feeding in through axis into other channel? suitable changes of concentration could then easily be made before feeding in. How to avoid that when we feed in into one channel overflow should go into action at the same spot? Maybe overflow could be in channel into which we do not feed at the same end.



better think this through
in each section with overflow
in every ~~sect~~ section between
two sides of partition

low pressure side causes no difficulty
but feed in at high pressure side would cause
not only overflow at other end but also overflow in every ~~sec~~ section into low pressure side

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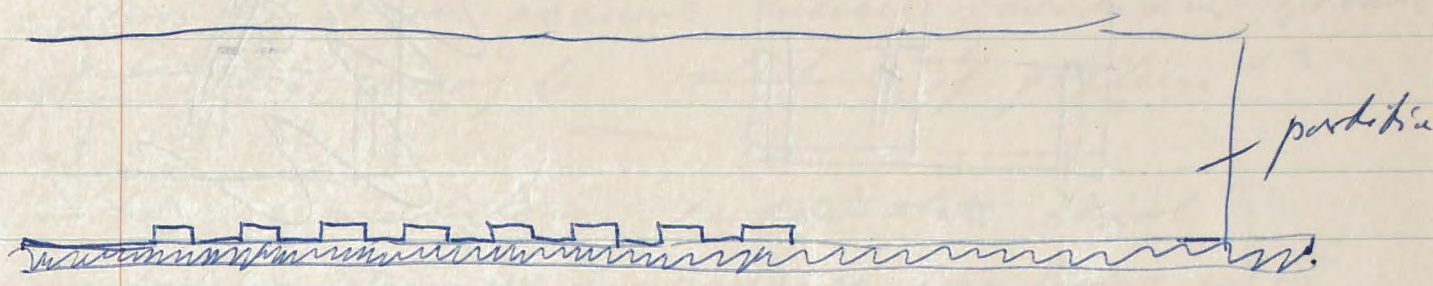
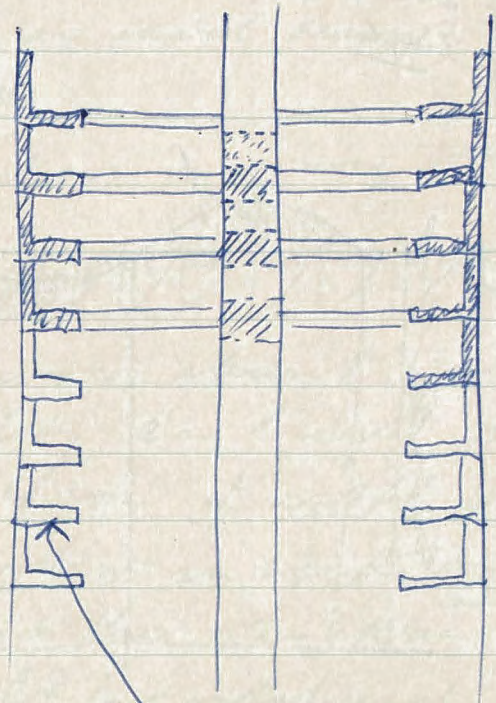
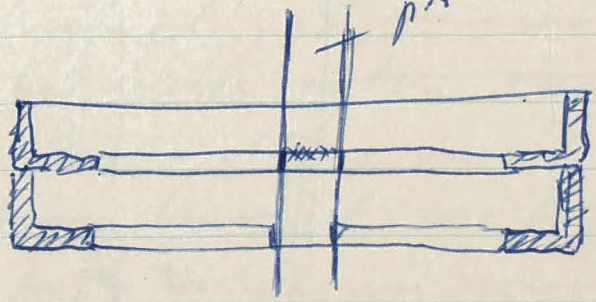
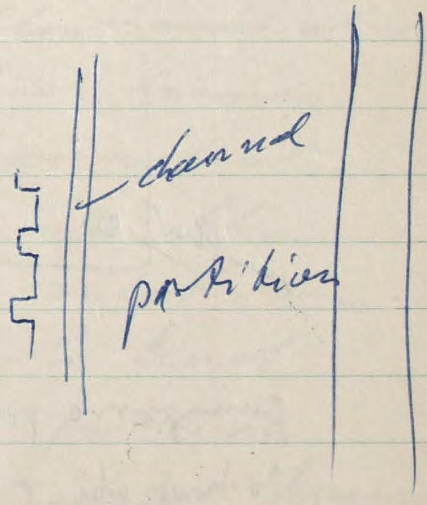
remedy for remark page 10. bottom.





or better: let the rings be undivided and only collar split





axial flow kept around by channel in partition
channel on both sides of partition

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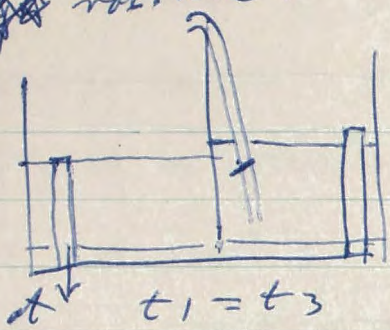
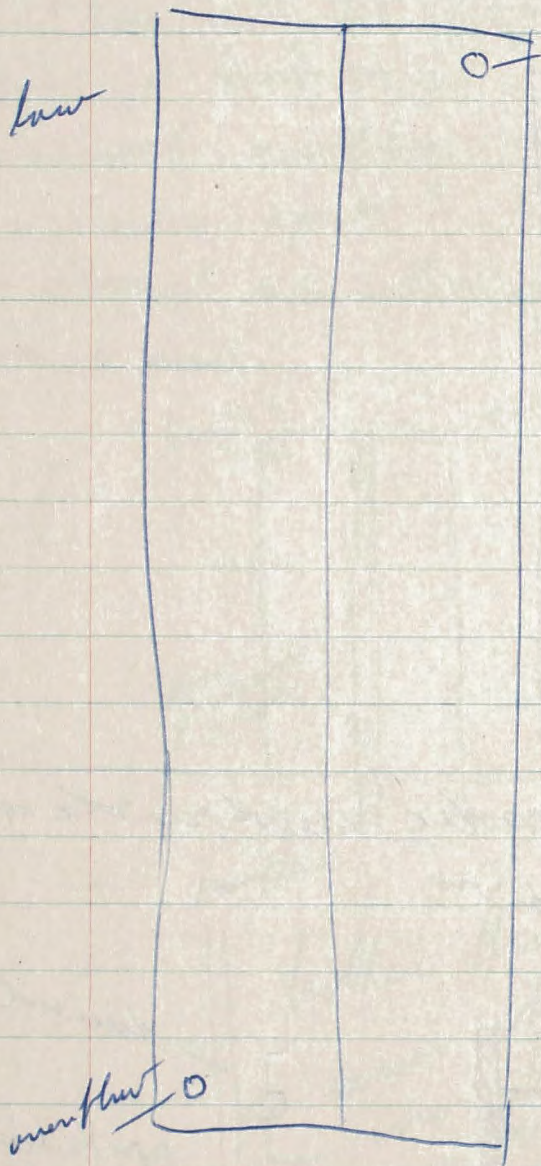
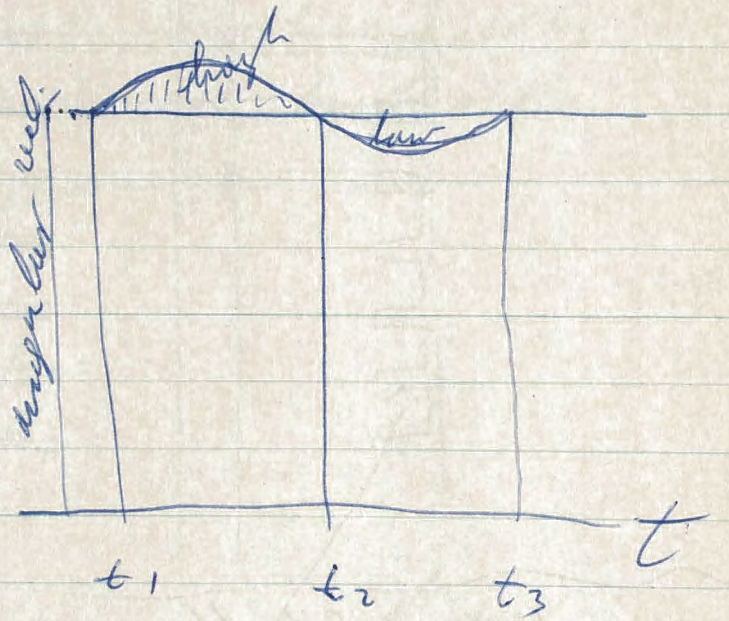
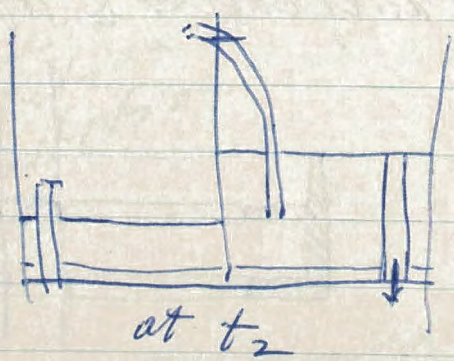
low ~~XXXX~~ rot. vel.









compare page 15

What about outflow of N-2 liquid?

unless feed in occurs when rotation speed high! This may be solution of problem!?

Could one maintain automatic axial circulation (having for instance two holes in each ring an axial temp gradient

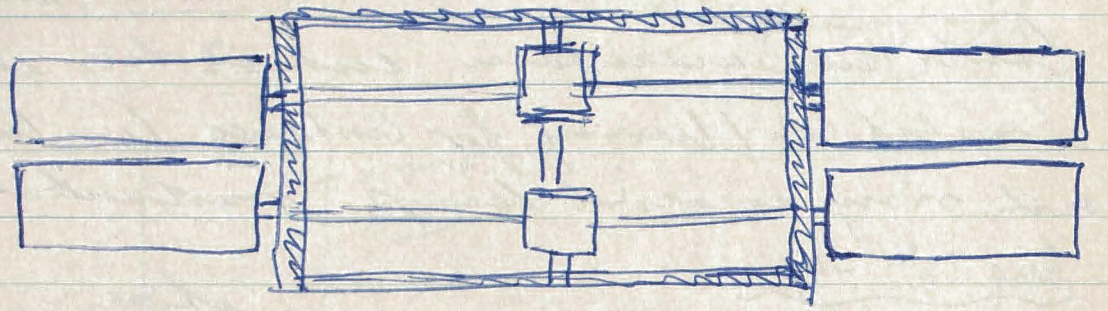
Aug 26th -46

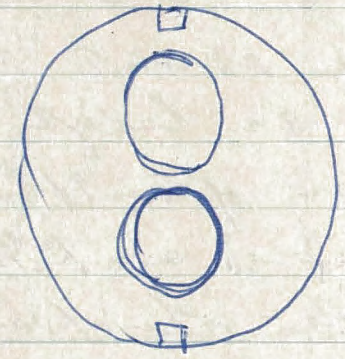
No! above is wrong conception.

~~But may be of considerable importance in axial circulation~~

Once more about axial circulation: difficulty in high pressure side because competition of outflow at end of channel and overflow in sections to low pressure side. This is the situation (simple outflow at end puts upper limit on level. At low rotational speed there is overflow ~~to~~ in sections to low pressure side but at high speeds level rises may reach outflow ~~and~~ at one end of channel; if amount which leaves there is fed back ~~in the same channel at the other end~~ at the same end into the low pressure channel we have circulation. During high rotation speed while level rises on high pressure side, level falls in low pressure side below outflow level, because there is no influx see sketch Page 17

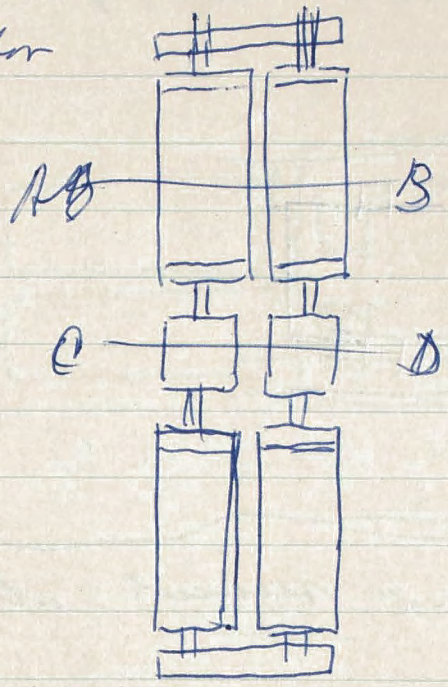
2 Window Cabin interior

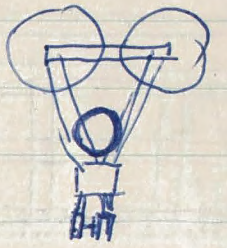




Page 18 airplane Aug 27-66 Caprad

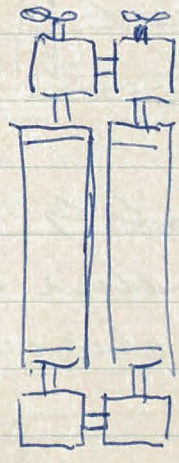
2 motor





fluid drive to propeller?

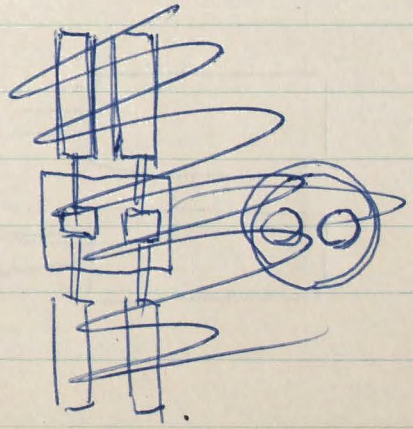
4 motor



- Propeller motor (in emergency rotor also)

- Rotor motor

~~Cabin in line~~



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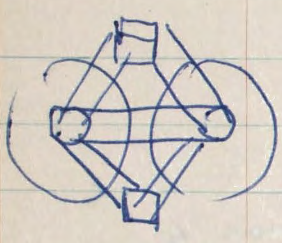
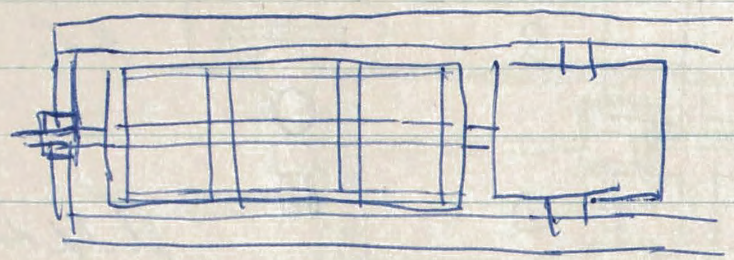
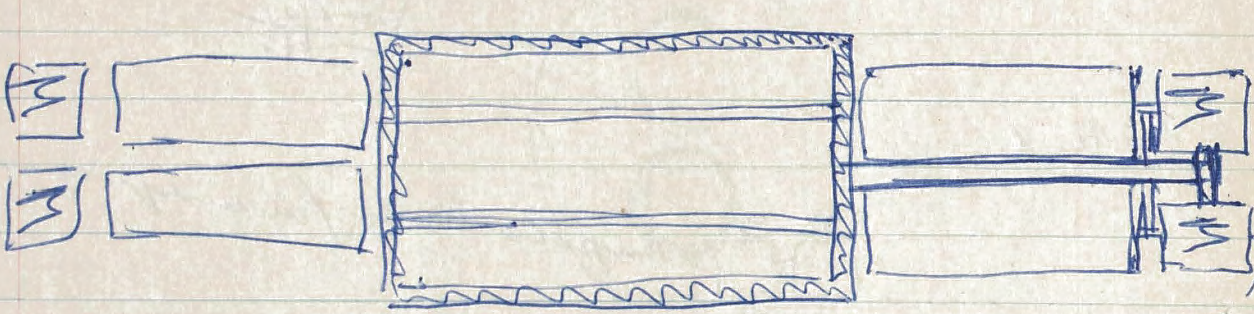
general lever to transmit forces

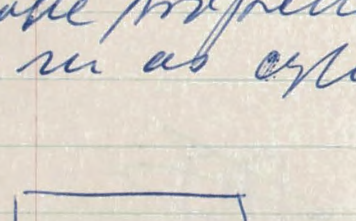


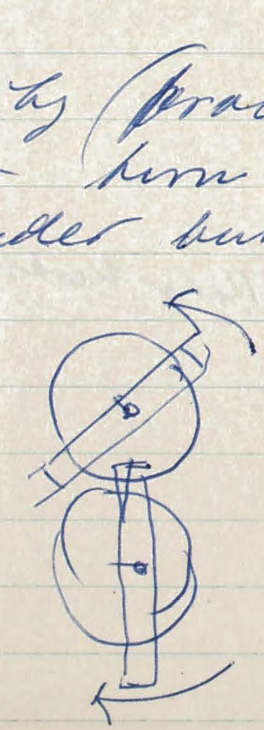


Vibrator Cabin in line second alternative



Other possibility (probably simpler) to make propeller turn same ~~set~~ rpm as cylinder but change pitch





blade change or ~~...~~ next motor to propeller !!!

difficulty rotations of prop. must be brought from distance of the axis !!!

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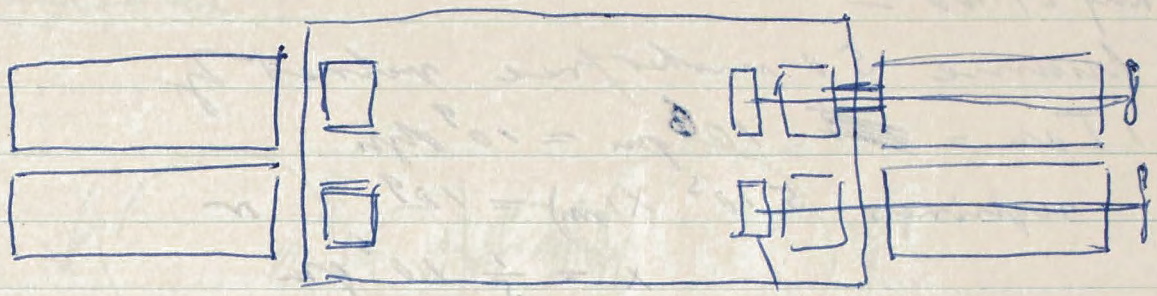
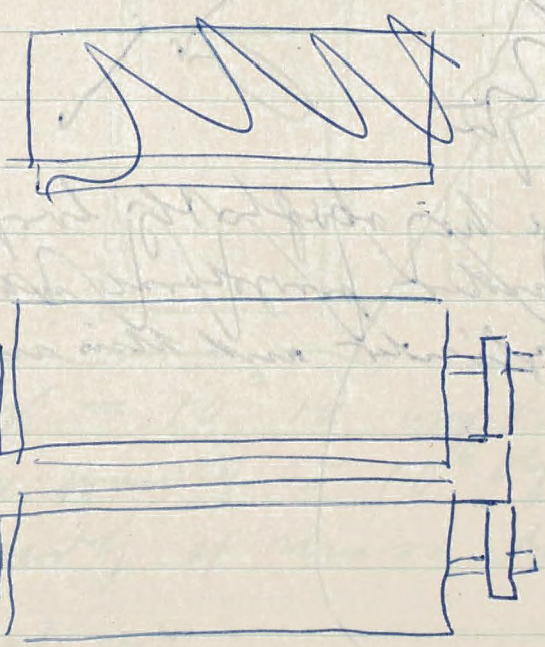
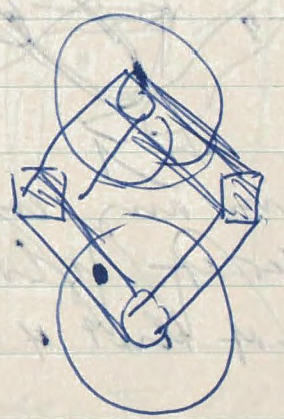
4 Motor Wheel and Base



motor for magnetic or fluid drive for propeller





Aug 29-46

with Beba Cole,

Aug 29.46 —

Assume 50 meter per sec velocity

1 Tan = ~~10^6~~ 10^6 gm = 10^9 dyn

requires $5 \times 10^3 \times (\text{cm}) = 10^9$ or

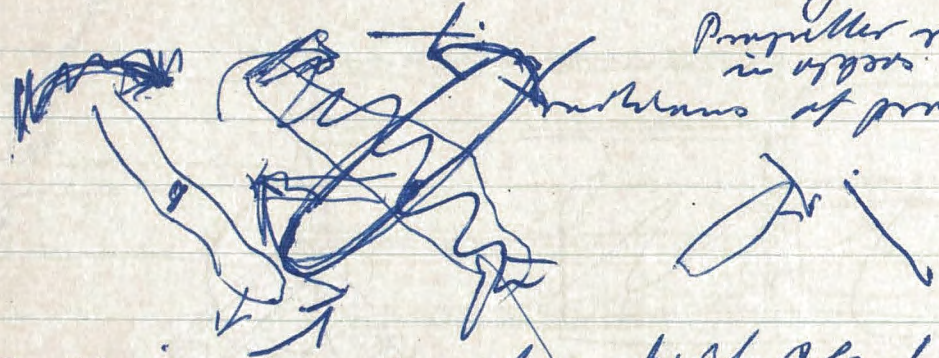
$x = \frac{1}{5} 10^6$ gm

$\frac{1}{5} 10^3$ kg = 200 kg

or 4 meter square mirror area

may be 1 cm thick 4 m long (Si)

Since

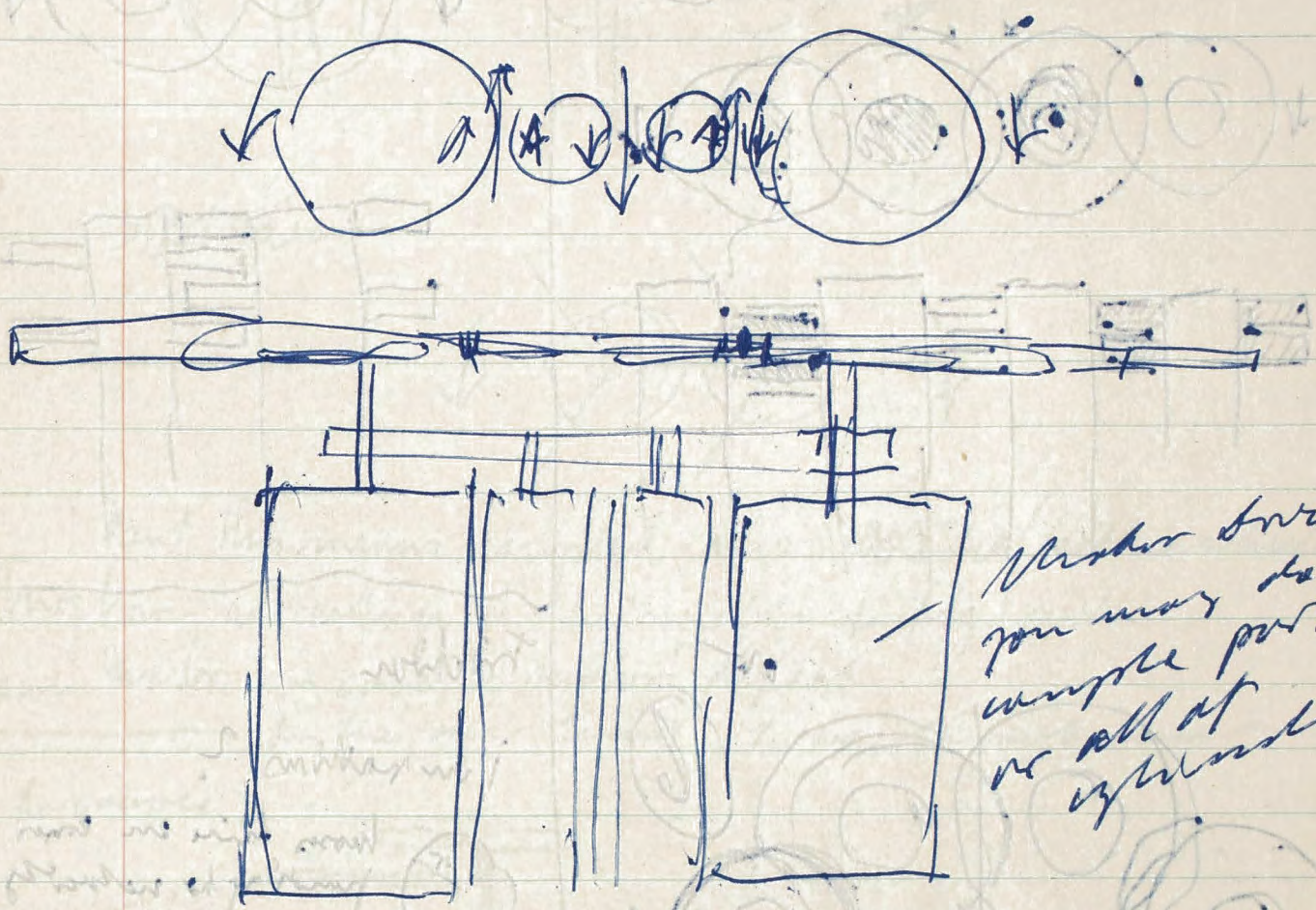


~~in~~ may in any case be slightly longer than diameter of cylinder providing velocity of propeller tip at edge of cylinder and this may be enough

Since radius of propeller can be made equal or slightly longer than ~~the~~ distance between the axes of the cylinders velocity of propeller tip can be twice that of cylinder peripheral velocity and this may be enough

Rupert Wednesday
Aug 22 - 46

In order to have same r. p.m. in cylinders and propeller:



1 kW = 10^3 10^7 erg/sec = 10^{10} erg/sec
1 kg gravity ≅ 10^6 dyne
velocity of mass thrown away:

$$\frac{\frac{mv^2}{2}}{mv} = 10^4$$

$v = 2 \cdot 10^4$ cm/sec = 200 meters/sec

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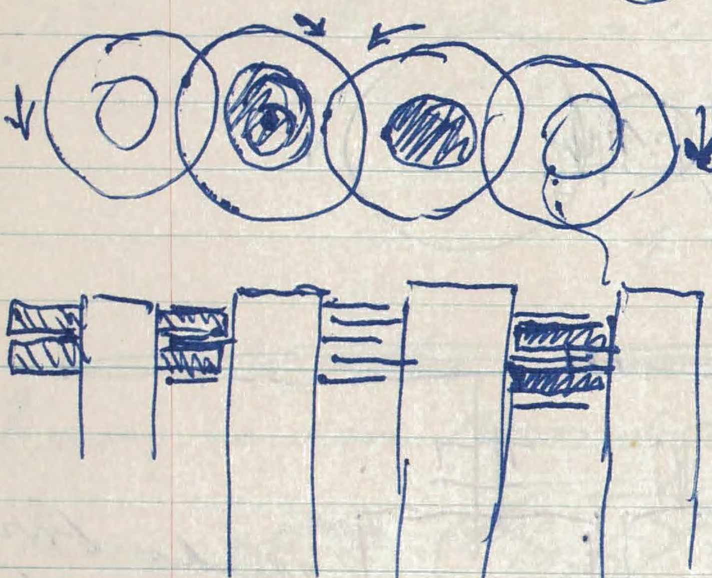
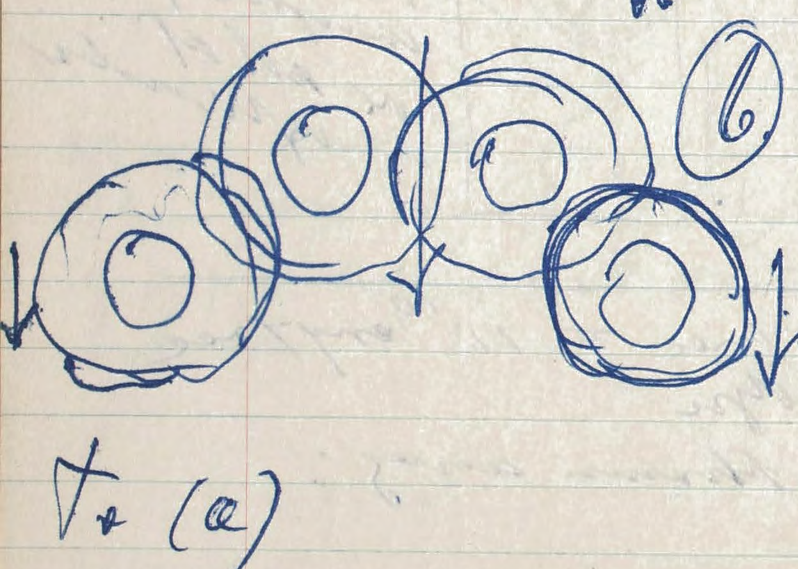
Different method (a.)



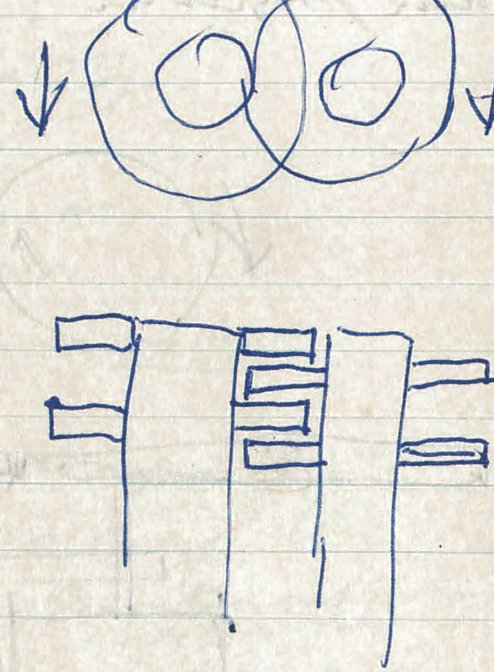
or (b)



To (a)

Warp Warp

Or (A)

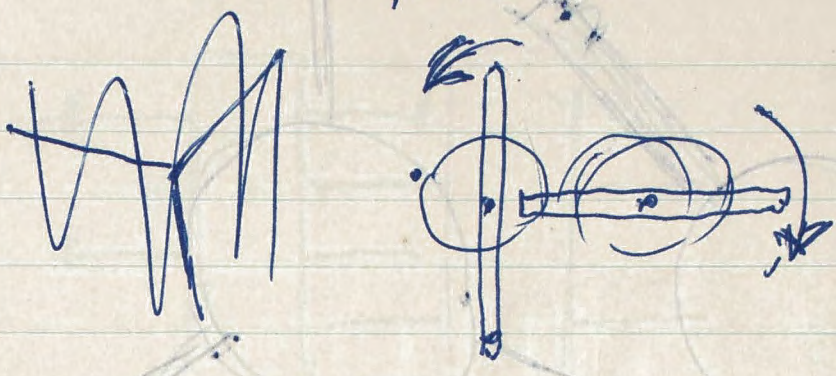


Trichter

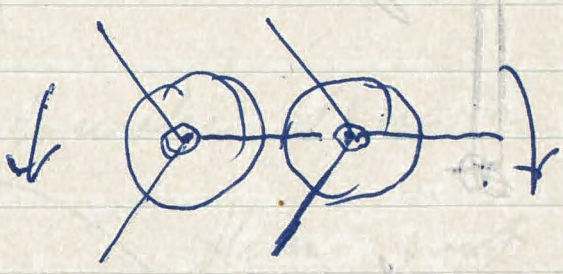
in pattern?

moves twice or more
pendulary to naturally
in 75 cm

2 Blades

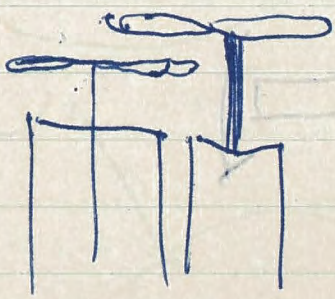


3 Blades



But this means coupled axis (earthed wheels) may have advantage of being able to fly with one motor in case of motor defect

——— on the other hand if we do not want to couple:



30 lb per square foot means 15 kg 900 cm² or

$15\ 10^4\ gr = 1.5\ 10^7\ dyn = 1.3\ v^2\ 900$

$\frac{1}{9}\ \frac{1.5}{1.3}\ 10^5 = \frac{1.5}{1.17}\ 10^4 = v^2 \quad v = 10^2\ cm/sec$

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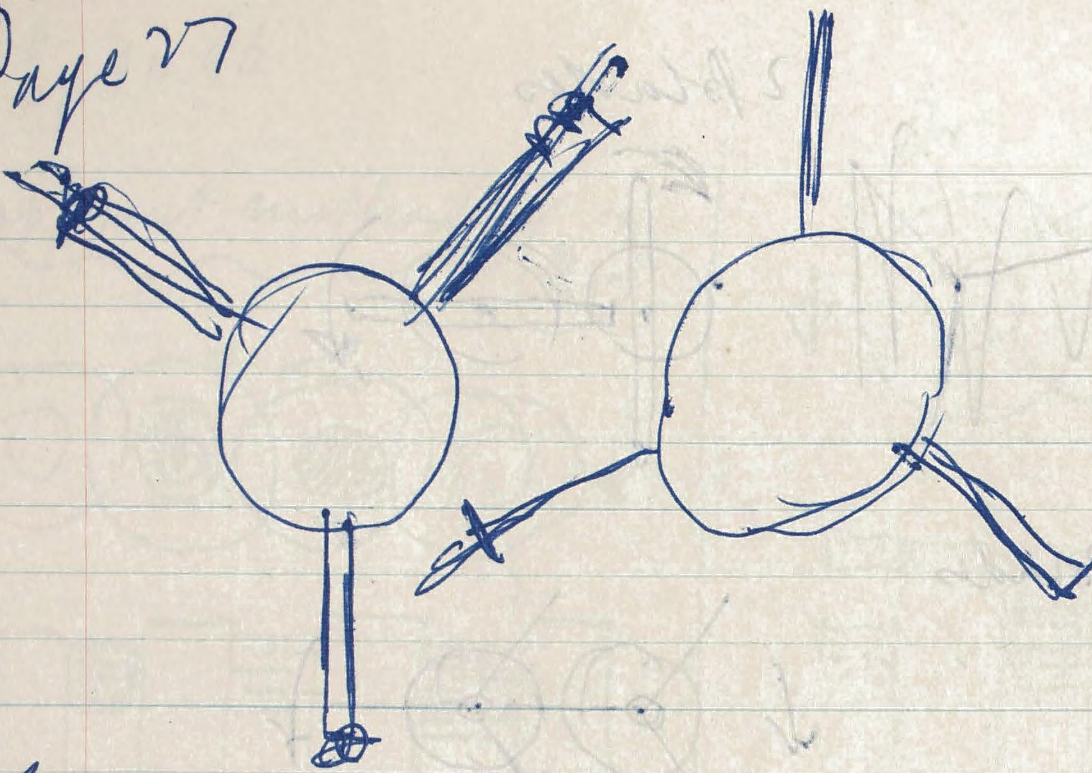
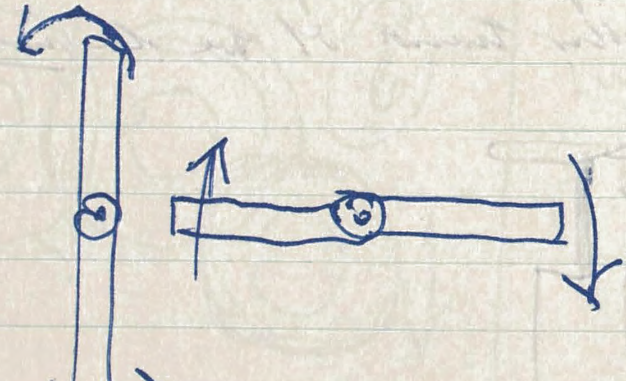
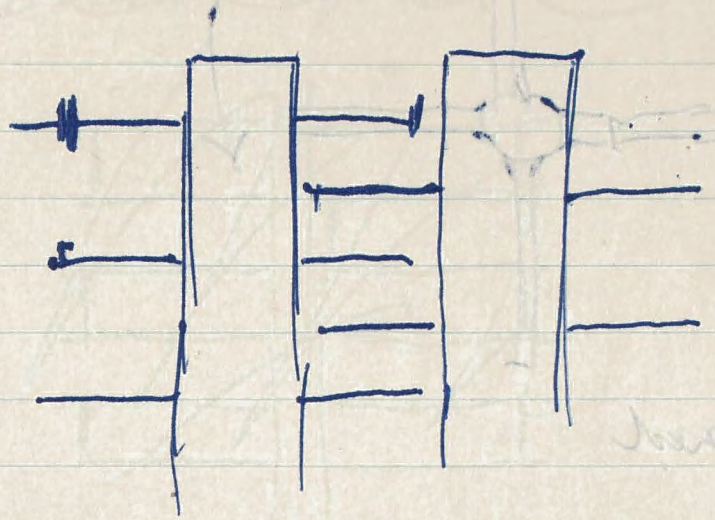


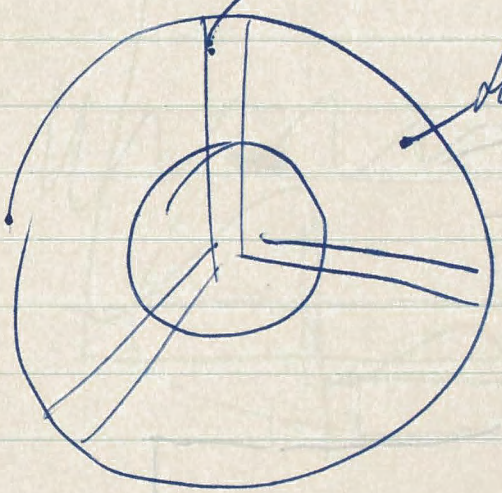
The [illegible] length 2 and – 46
two might do



what about drag at tip?

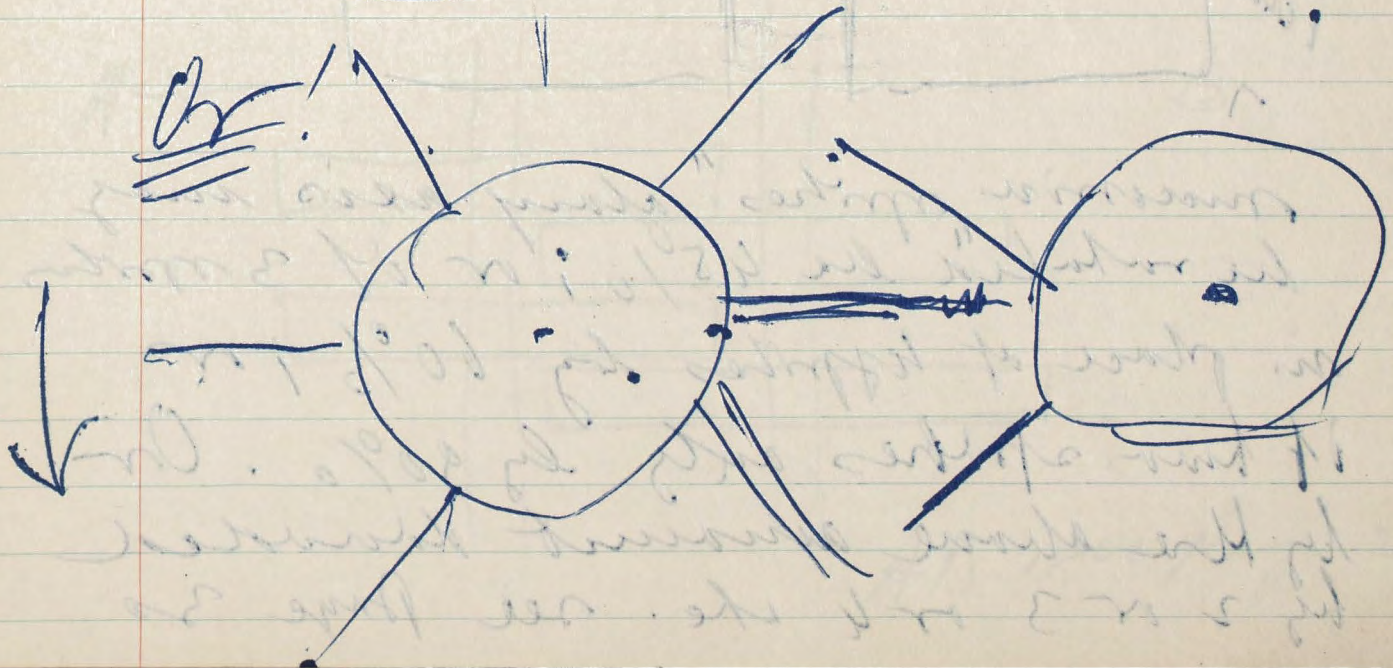


To make it more rigid



this just enough to transmit force lifting the system

Or!



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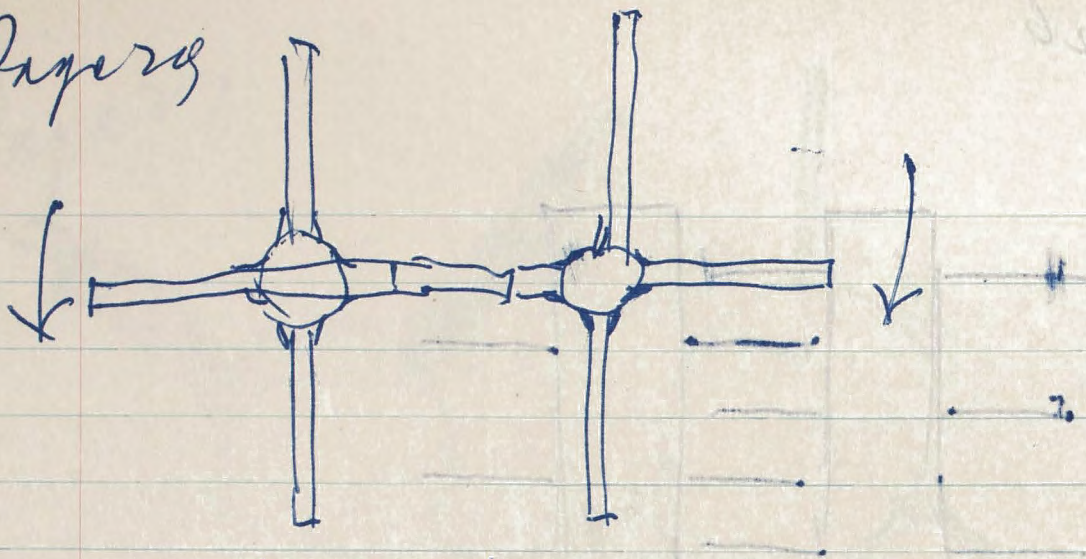
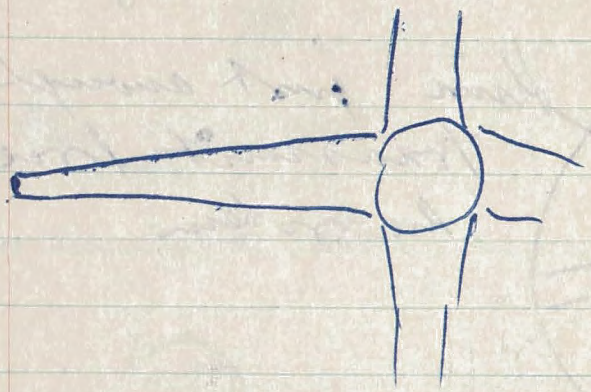
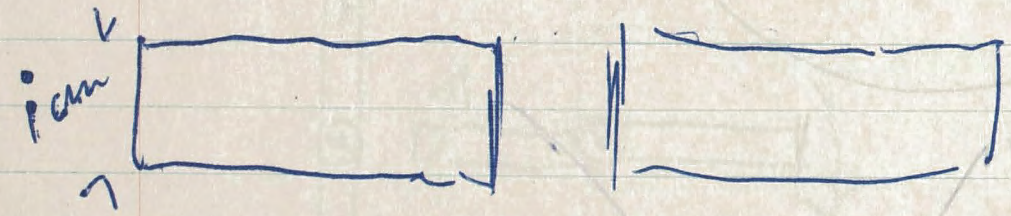


not symmetrical





successive spikes" along axis may be rotated by 45° i or of 3 spokes in place of 4 spokes by 60% i or if two spokes only by 90%. Or by the above amount divided by 2 or 3 or 4 etc. see Page 30

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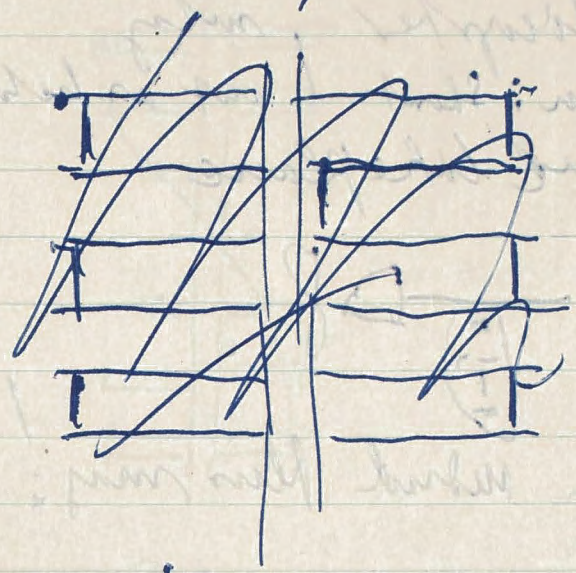

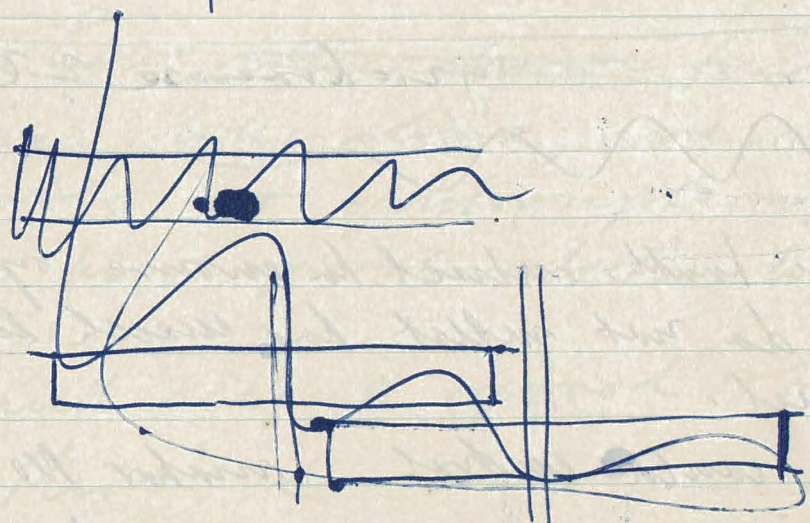

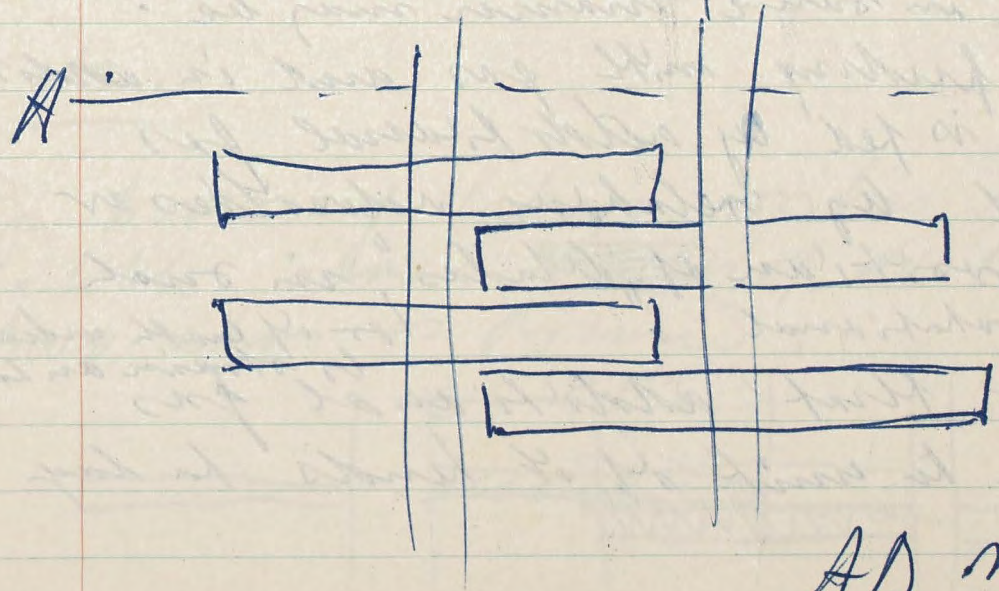

AB see Page 29

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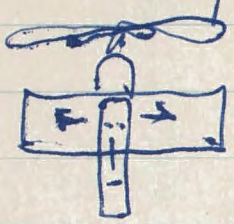
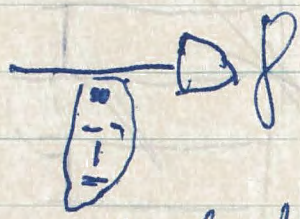
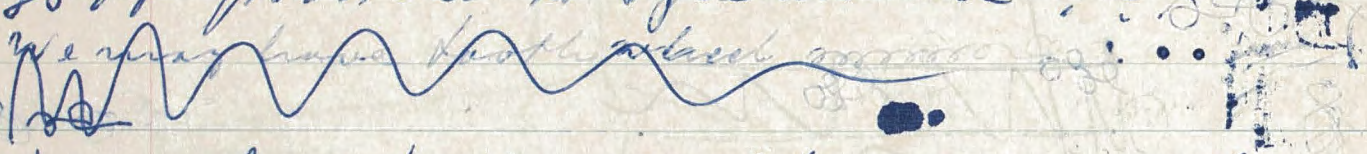
Meridionally: Helicopter, only
not rotating cabin: Short / and as helicopter
travel take place





No correction for wind flies may!

Is it possible to synchronise ??



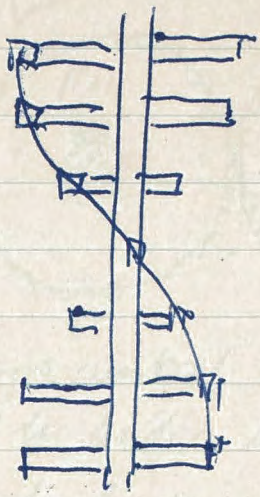
We may have both wheel to ensure equilibrium but do not admit too much load on both wheel.

Axis of No 1 could control motor No 2 and vice versa in some manner may be.

Or joint feeding with gas and in addition each unit is fed by additional gas controlled by relative velocities or relative position of „blades" in such rotational

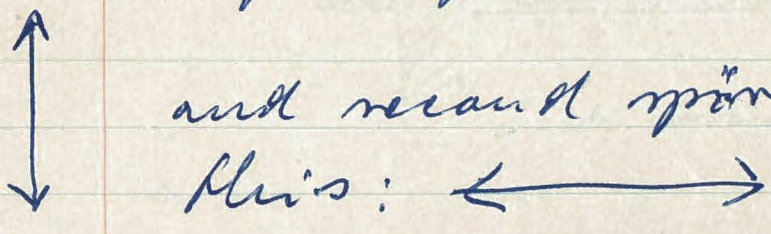
a manner that additional gas / or if both wheel to obtain an unbalance is given to unit of it tends to lag behind.

Page 30 2 Spokes spiral



The two spirals in opposite direction if not synchronous operation planned; otherwise both spirals in same direction and spokes "meet" when top of one closest to axis of other

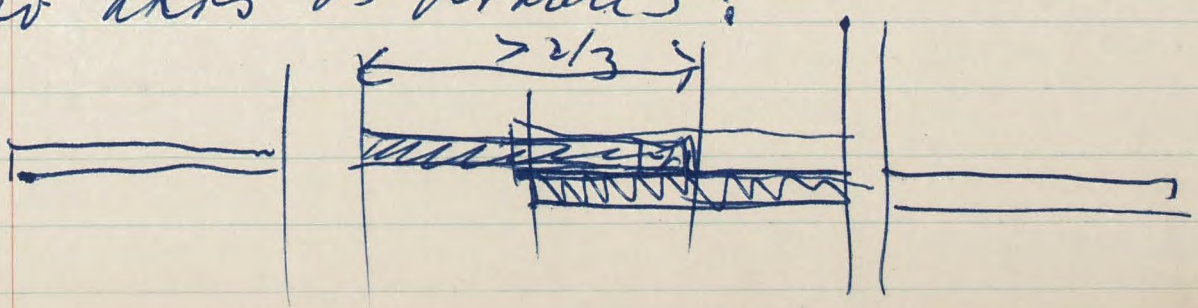
If we have ~~two above~~ for instance 2 spokes, like above, we may have a double ~~or~~ or quadruple spiral etc. that is first spiral starts like this

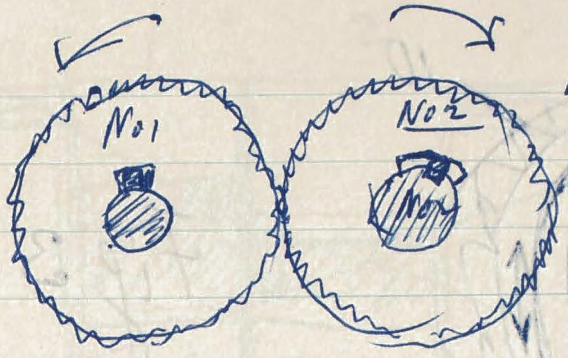


and second spiral starts like this: ⟷

etc.

In drawing let us spokes reach a little above ~~half~~ 2/3 of distance of two axes as drawn 3:

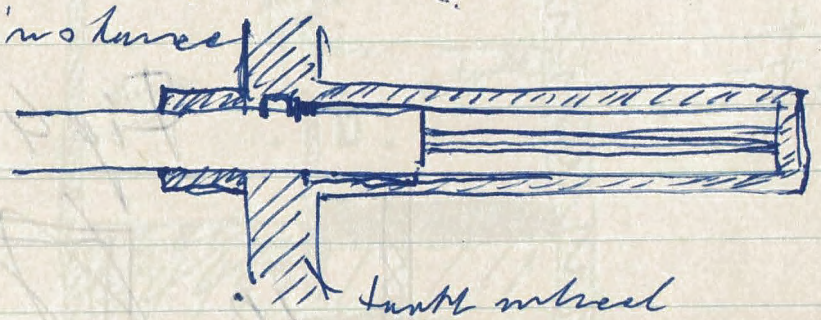




Relative positions of No 2 Wheel to No 2 axle are controlled by

Perhaps control by strain rather than position would be better but how? Sometimes for instance tooth wheel on axle does not rotate freely even within limited angle but is held in normal position in some elastic manner.

For instance



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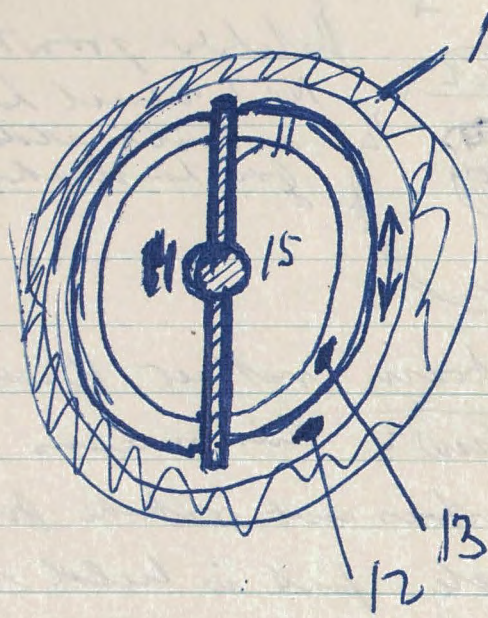
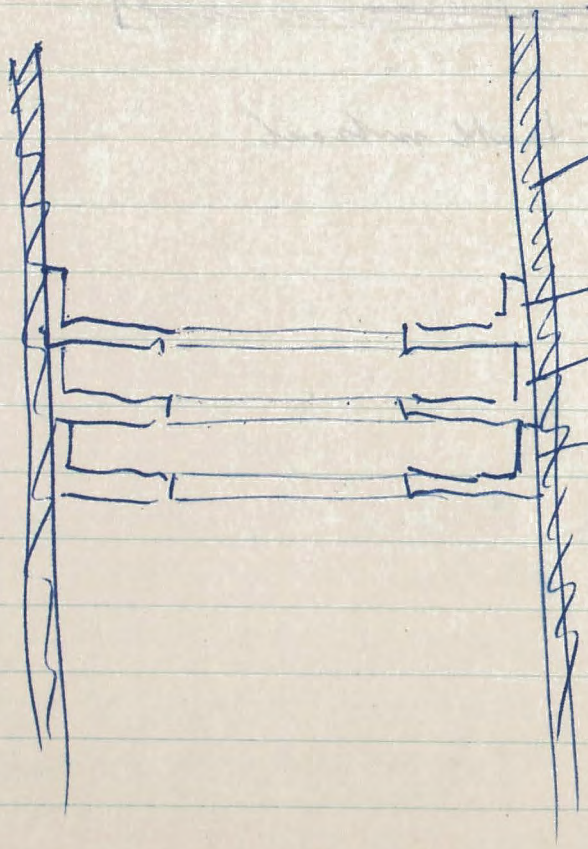
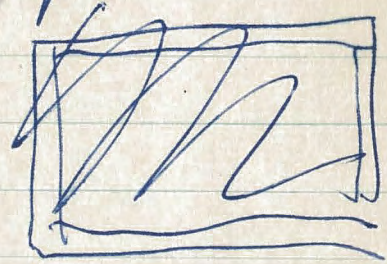


Fig 3.

Arrow overflow!

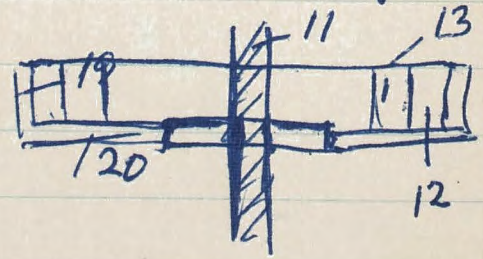
Fig 4





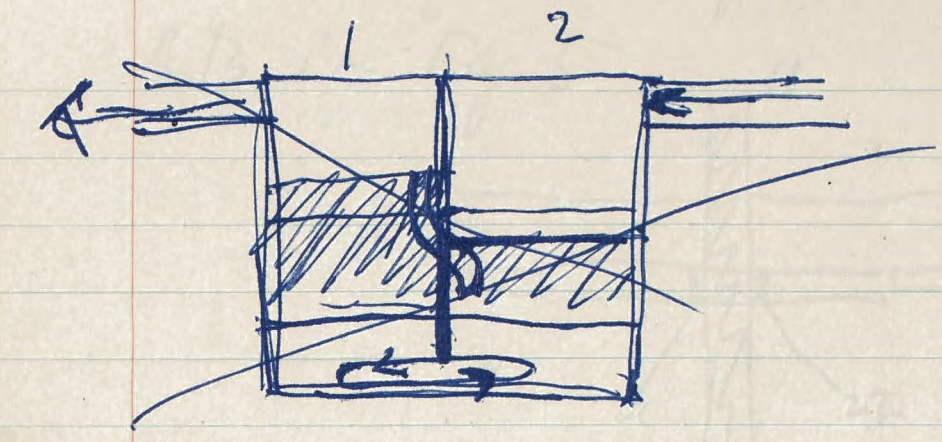
A

Fig 5



B

Ref 16 — 46



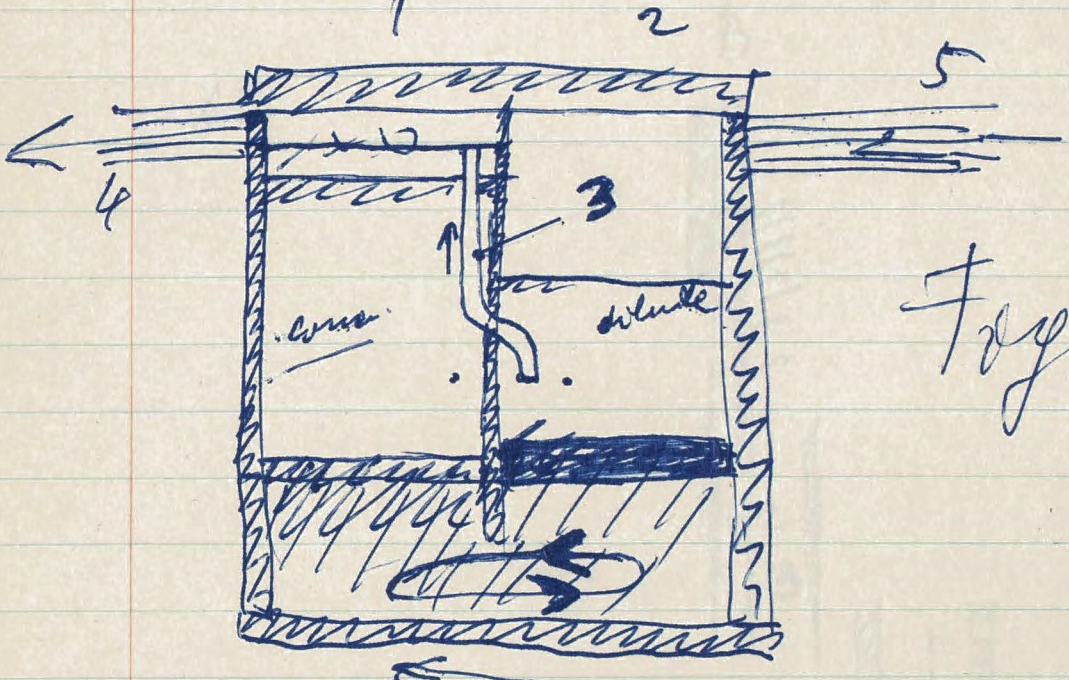
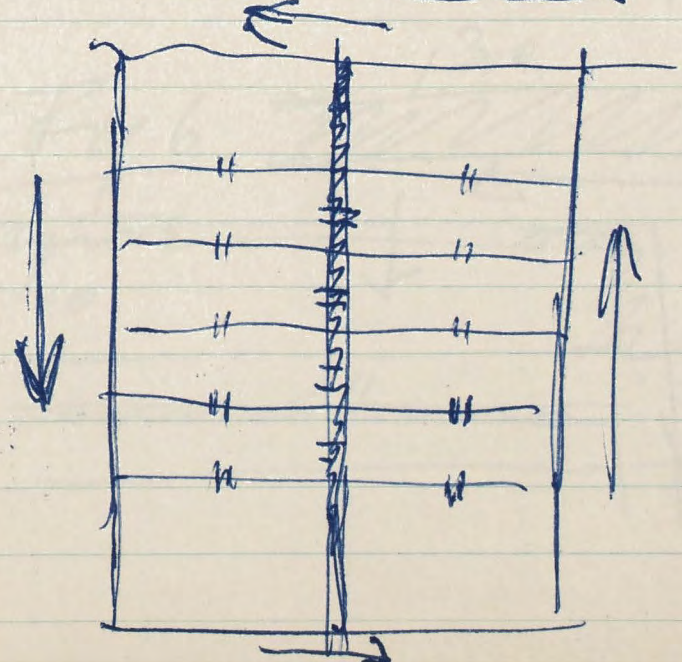


Fig 1



a

b

Fig 2

AB in Fig 5

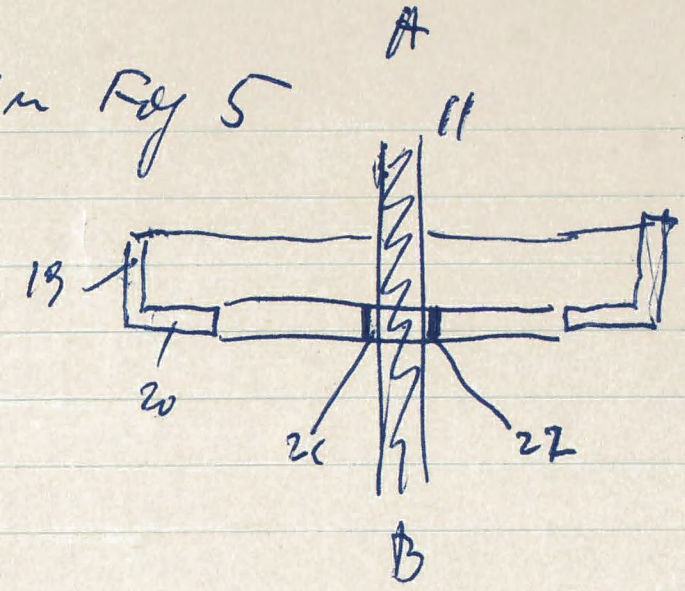


Fig 5

AB

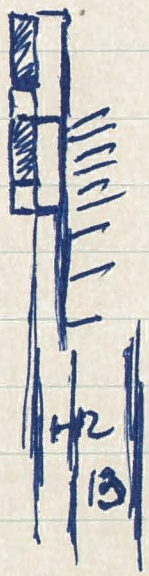
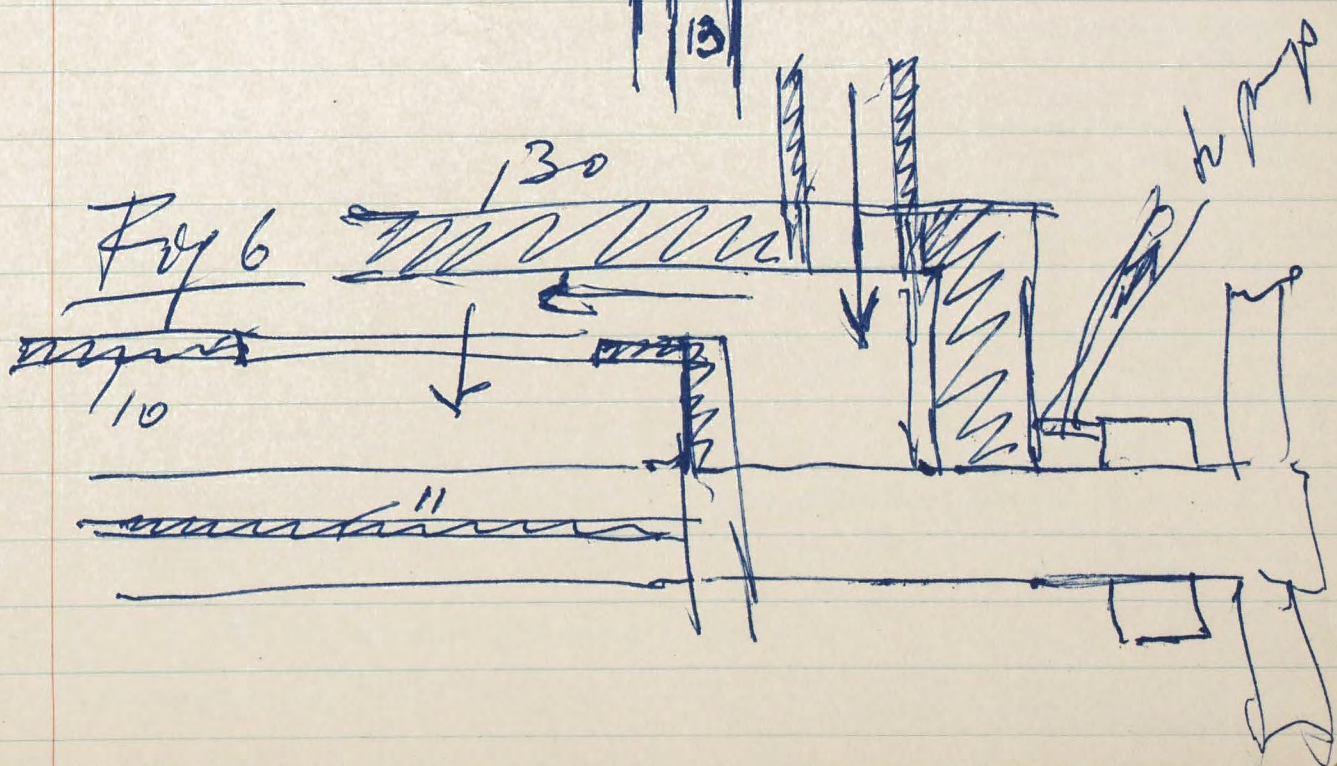
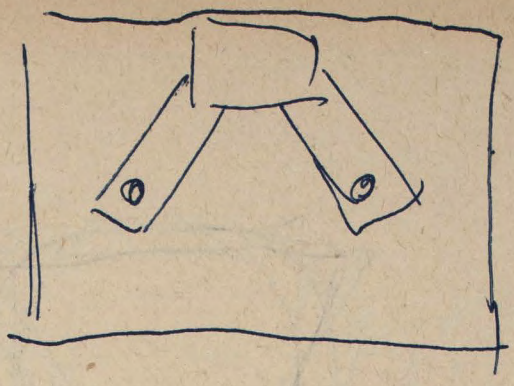
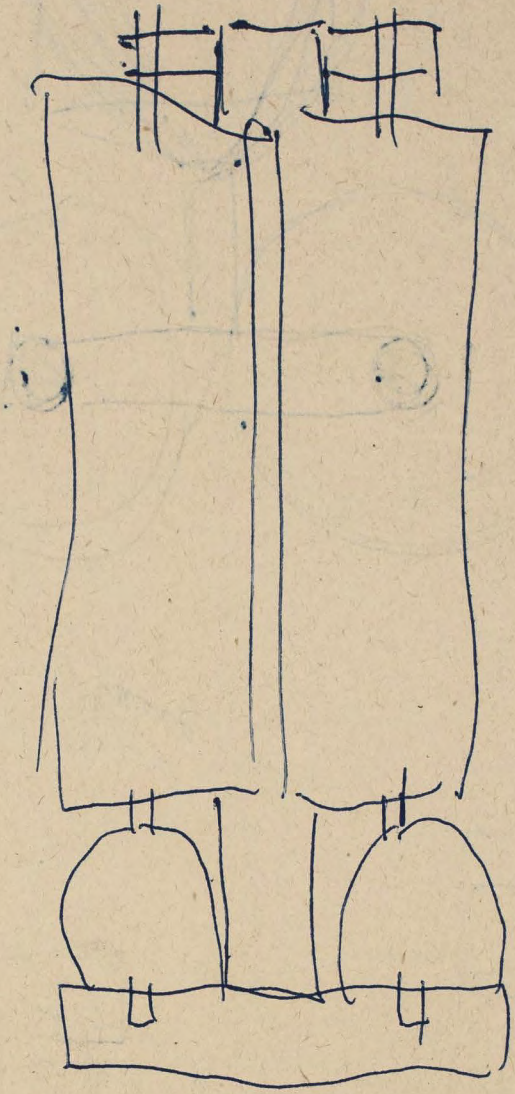


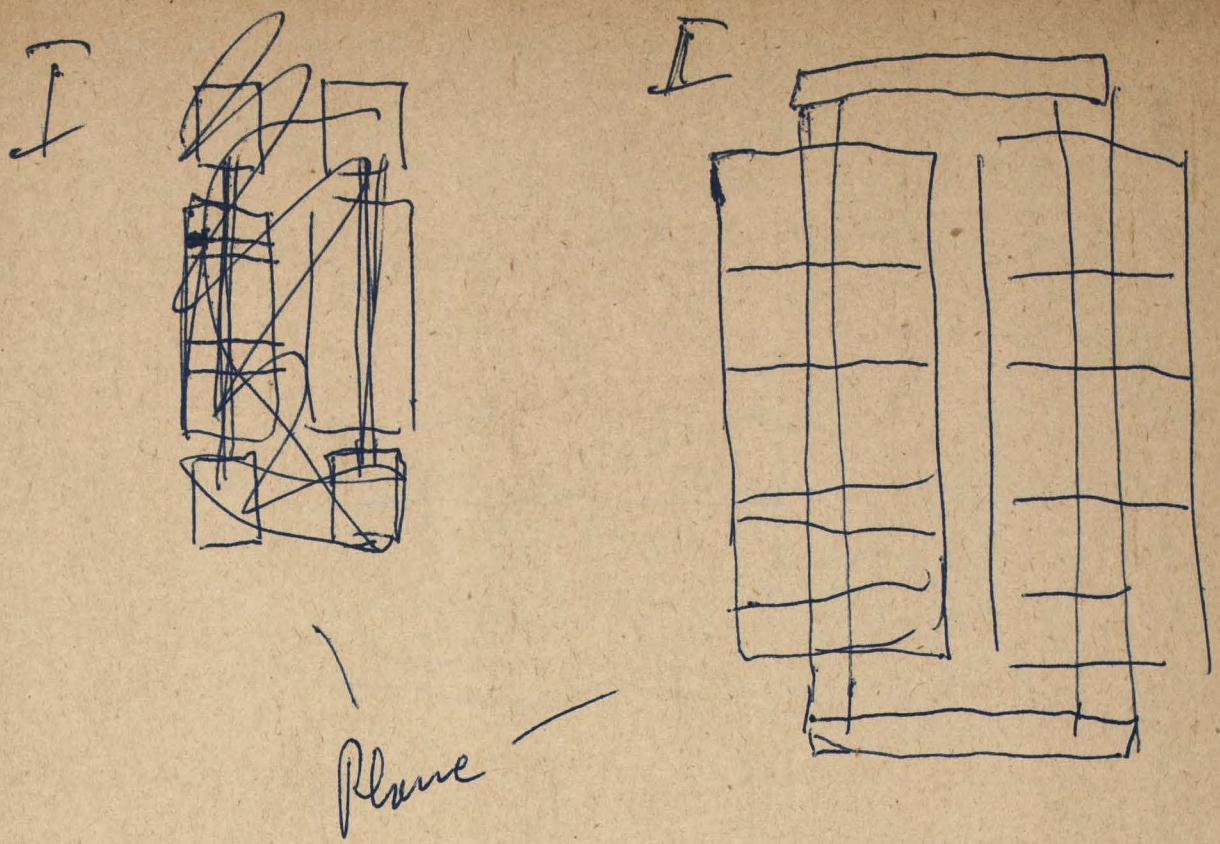
Fig 6







Ventil


I
I
Plane