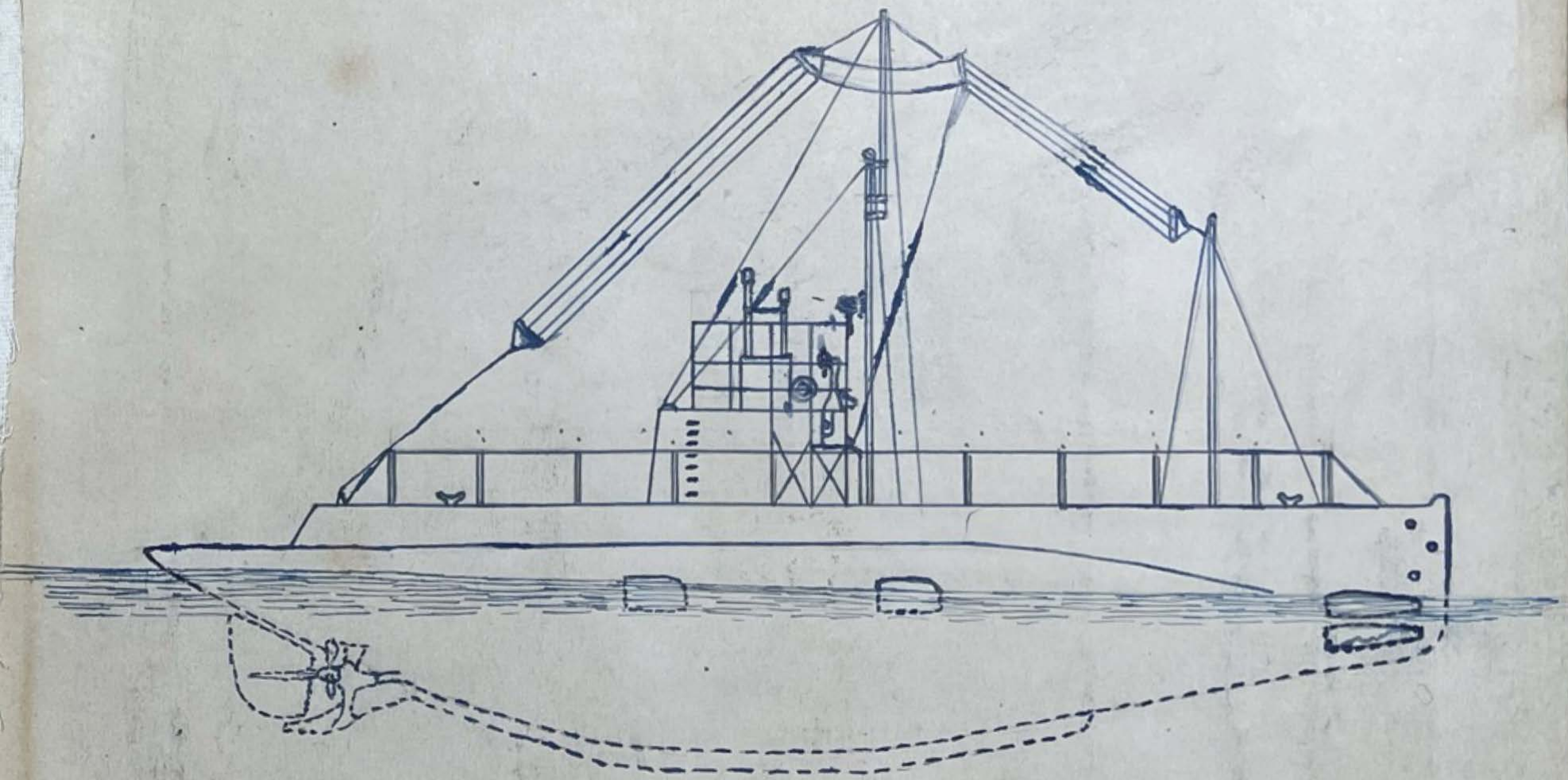
Louis C. Gilde,
Submarine School,
Sub. Base,
New London,
Conn.



Lake Type.

1.- Watertight Superstructure.
2.- Hydroplanes for submerged control.
3.- The rising axis instead of straight spindle form.
4.- The equilibrium control.

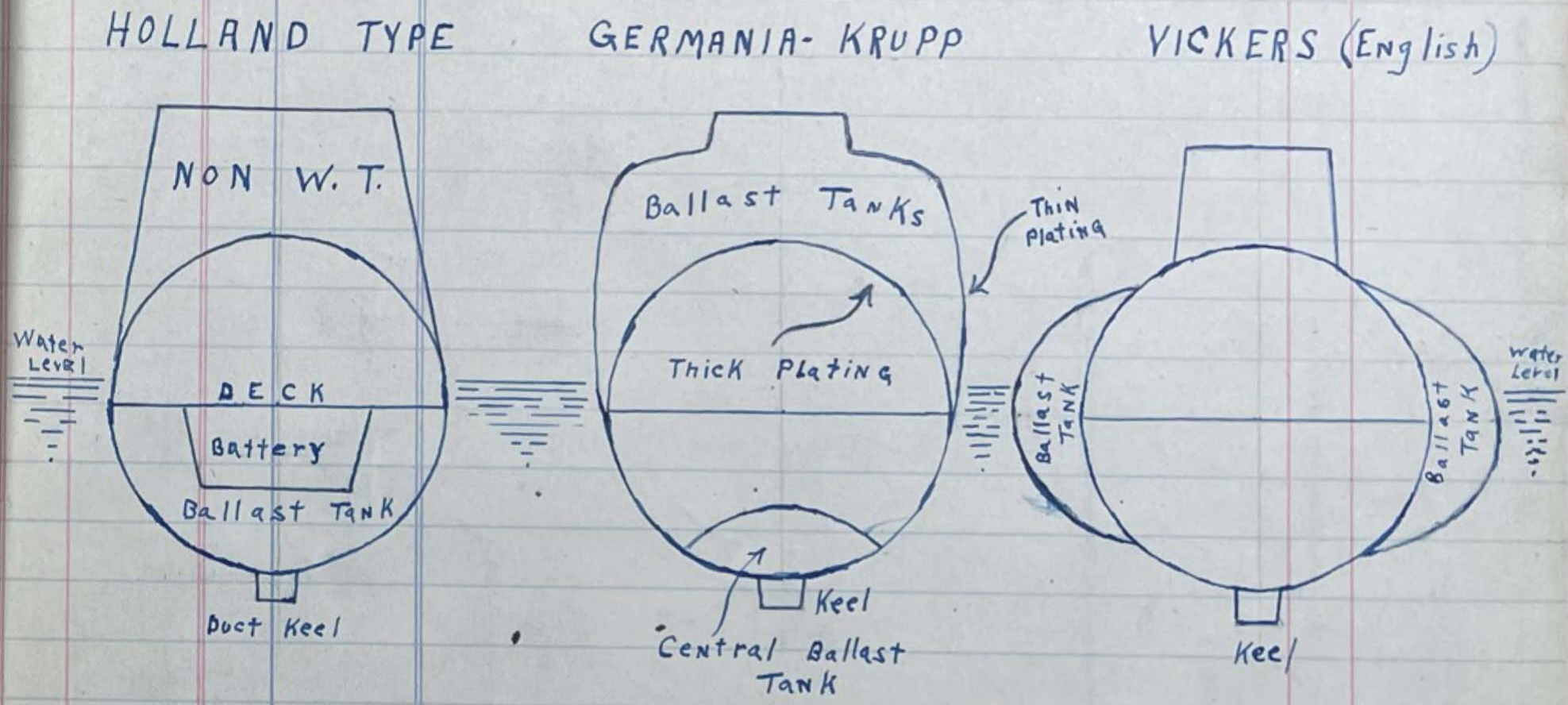
Holland Type.

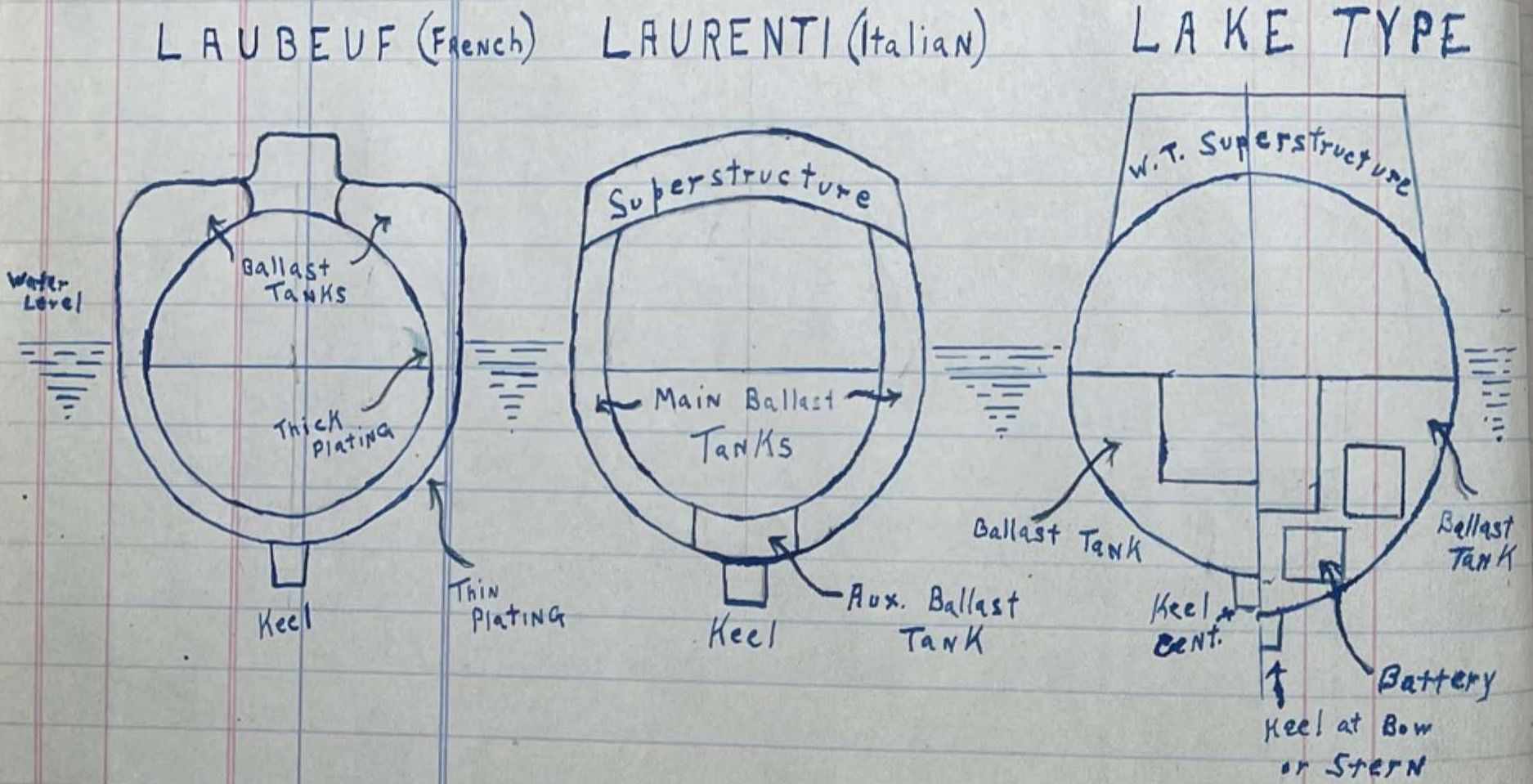
1.- Single hull type.
2.- Now Watertight superstructure.
3.- Divided from three to five separate compartments by watertight bulkheads.

Remember that:

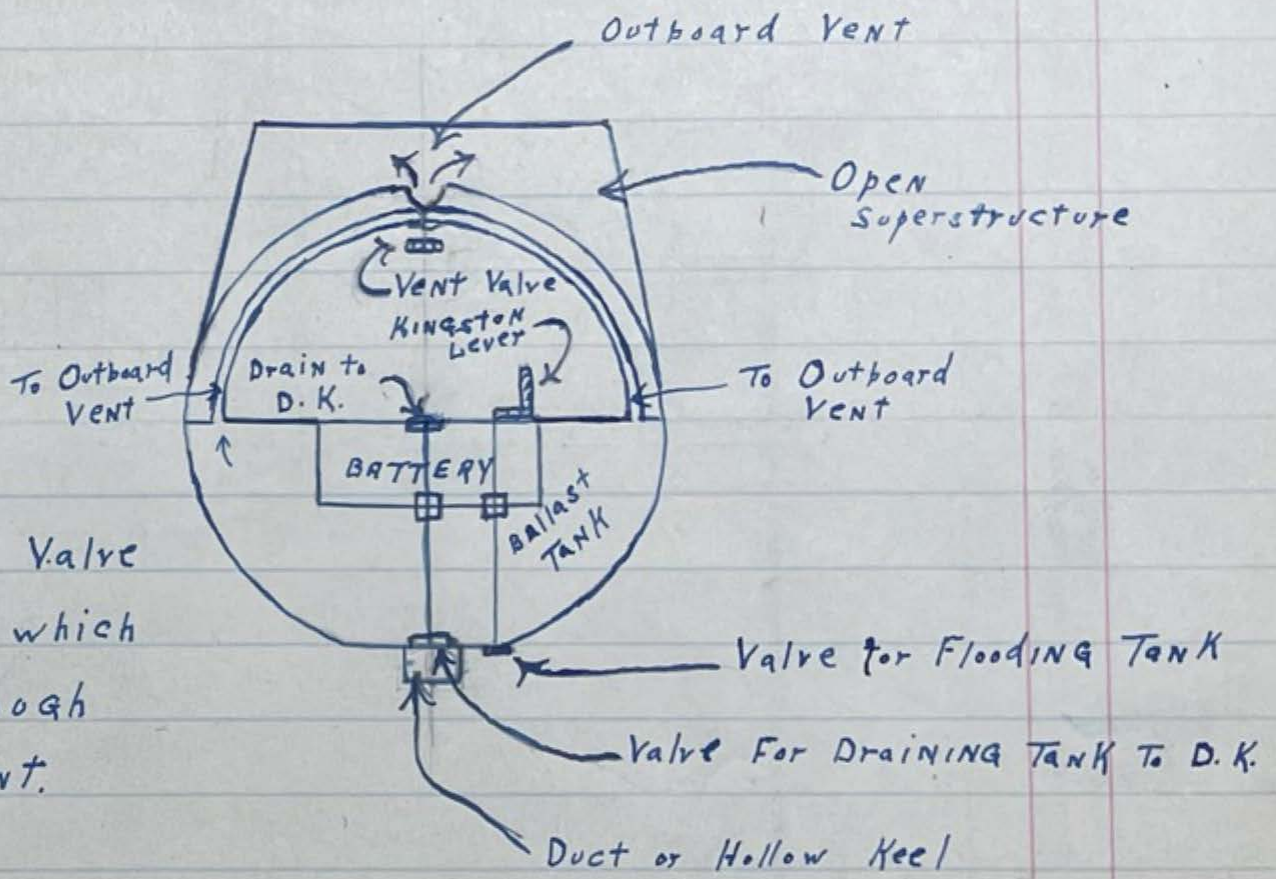
A submarine or oil of less weight will float.

Six Prominent Types of Submarines.



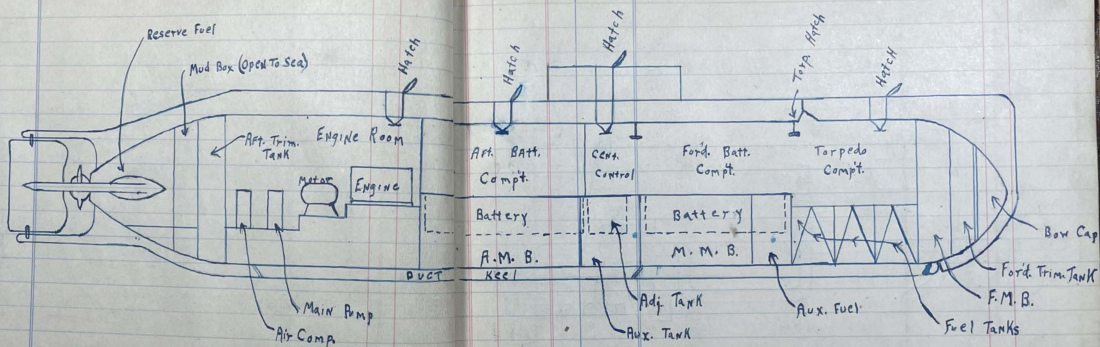

LAUBEUF (French)
LAURENTI (Italian)
LAKE TYPE
Water Level
Ballast Tanks
Thick Plating
Thin Plating
Keel
Superstructure
Main Ballast Tanks
Keel
Aux. Ballast Tank
W.T. Superstructure
Ballast Tank
Ballast Tank
Keel Cent.
Battery
Keel at Bow or Stern

Flooding and Venting Tanks.

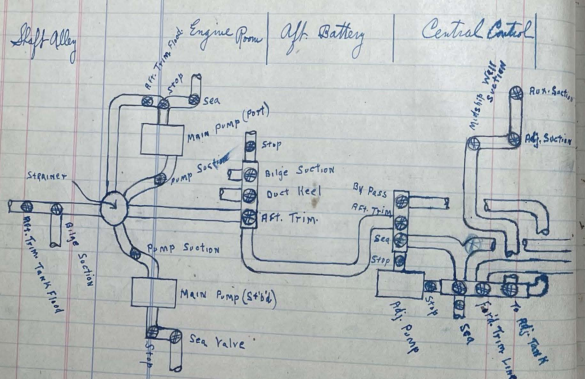


Opening Kingston Valve lets water into tank which forces air in tank through pipes to outboard vent.

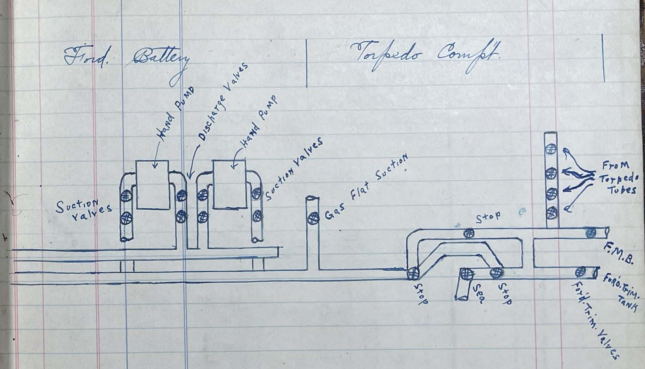
Tank cannot flood with Vent closed.
" " be blown " " open.
" " drain " " closed.


Reserve Fuel
Mud Box (Open To Sea)
Hatch
Aft. Trim. Tank
Engine Room
Motor
Engine
Main Pump
Air Comp.
Duct
Hatch
Hatch
Trip Hatch
Hatch
Aft. Batt. Compt.
Cent. Control
Ford. Batt. Compt.
Torpedo Compt.
Battery
Battery
A.M.B.
M.M.B.
Keel
Adj. Tank
Aux. Tank
Aux. Fuel
Fuel Tanks
F.M.B.
Ford. Trim. Tank
Bow Cap
HOLLAND TYPE
'D' TYPE.

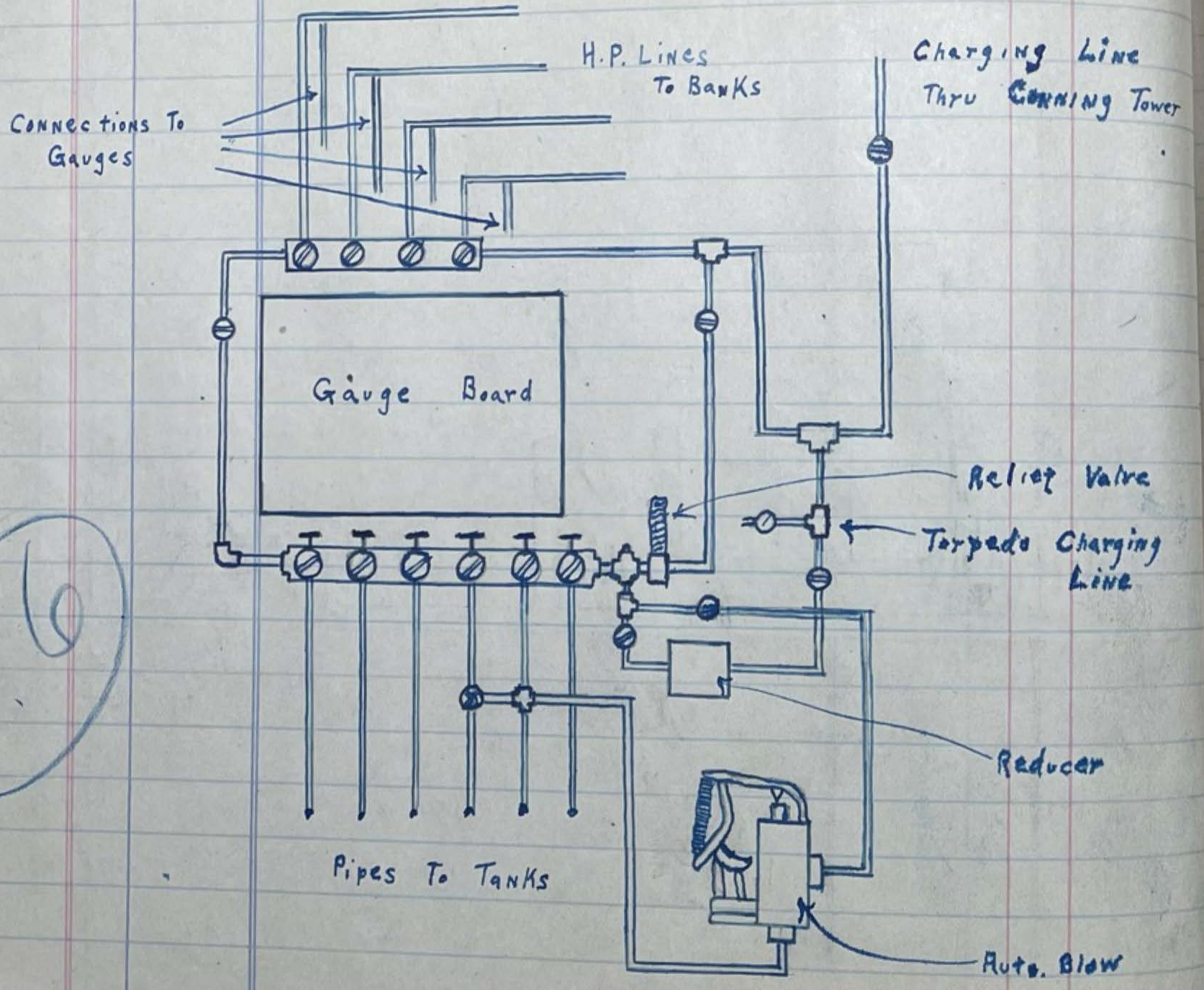
TRIMMING LINE —



Holland Boats.



AIR MANIFOLD - CENTRAL CONTROL COMP'T.



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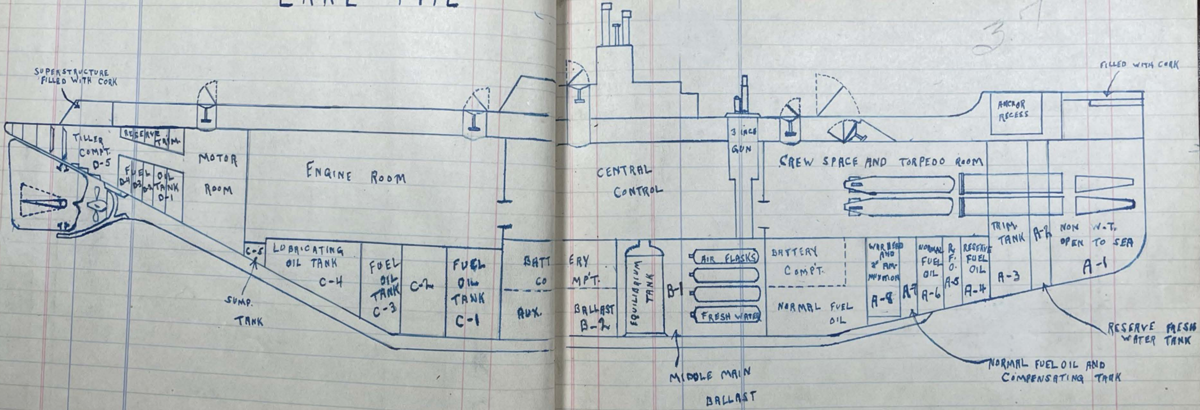
LAKE TYPE


SUPERSTRUCTURE FILLED WITH CORK
TILLER COMPT. D-5
RESERVE TRIM.
FUEL OIL TANK D-1
D-4
D-3
D-2
MOTOR ROOM
ENGINE ROOM
CENTRAL CONTROL
3 INCH GUN
CREW SPACE AND TORPEDO ROOM
ANCHOR RECESS
FILLED WITH CORK
C-5
SUMP. TANK
LUBRICATING OIL TANK C-4
FUEL OIL TANK C-3
C-2
FUEL OIL TANK C-1
BATTERY COMP'T.
AUX.
BALLAST B-2
EQUILIBRIUM TANK
B-1
AIR FLASKS
FRESH WATER
MIDDLE MAIN BALLAST
BATTERY COMP'T.
NORMAL FUEL OIL
WAR HEAD AND 3" AMMUNITION
A-8
A-7
NORMAL FUEL OIL
A-6
R. F. O.
A-5
RESERVE FUEL OIL
A-4
TRIM TANK
A-3
A-2
NON W.T. OPEN TO SEA
A-1
RESERVE FRESH WATER TANK
NORMAL FUEL OIL AND COMPENSATING TANK

SUBMARINE DATA SHEET.

CLASS	No. IN CLASS	DISPLACEMENT SURFACE	DISPLACEMENT SUBMERGED	RESERVE BOUYANCY	LENGTH OVER ALL	MOULDED AND EXTREME DIAMETER	SPEED AND RADIUS: SURFACE FULL SPEED	SURFACE CRUISE SPEED	SUBMERGED 1 HR. RATE	SUBMERGED 3 HR. RATE	HORSE POWER: TOTAL ENGINES	TOTAL MOTOR 3 HR. RATE	TYPE OF BOAT
A-2-7	6	106.55	122.55	12%	63'9 7/8"	11'10 1/4"	8.5 450	6	7.2	19.5	160	70	HOLLAND
B-1-3	3	145	175	14%	82'5"	12'5 1/2	9.5 850	7 5/10	8.2	25.5	250	115	"
C-1-5	5	240	273	12%	105'3 1/2	13'10 1/2	11 725	8.13 776	9.25	8 24	500	230	"
D-1-3	3	288	337	11.6%	134'10"	13'10 5/8"	13 910	9.6 1179	9.5	8 24	600	260	"
E-1-2	2	287.2	342.1	14%	135'2 3/4"	14'6 7/8"	13.46 1900	10.7 2090	11.66	9 27	360	270	"
F-1-3	3	330.2	400	17.5%	142'7"	15'4 5/8"	13.5 1344	11 2500	11.25	8.5 25.5	620	320	"
G-1	1	400	516	22.4%	161'	13'	11.5	10 2000	10	8 24	600	380	LAKE
G-2	1	375	481	22%	161'	13'	11	10.5	10.5	8.5 25.5	600	600	"
G-3	1	393	468	14%	161'	13'1 66"	14	3500	9.5	8.5 25.5	1200	380	"
G-4	1	370.6	452.2	18%	157'5 1/4"	17'6 1/8"	14	3200	9.5	8 24	920	490	LAURENTI
H-1-3	3	358	434	17%	150'3.5	15'9.3/8	14	11.5 2500	10.5	8.5 25.5	950	320	HOLLAND
K-1-8	8	392	520	24.6%	153'6 1/2"	16'8 1/8"	14 1680	11 3150	10.5	8.5 25.5	K1-4 950 K5-8 900	340	"
L-1-4	7	450	548	18%	168'5 5/8"	16'10 5/8 47'5.8	14 1680	11 3150	10.5	8.5 25.5	900	340	"
L-5-8	4	451	527	14.4%	165'	14'9"	14 1680	11 3150	10.5	8.5 25.5	1200	400	LAKE
M-1	1	488	676	27.8%	196'3"	19'1/2"	14 1680	11 3150	10.5	8.5 25.5	840	340	SPEAR
N-1-3	3	347.9	414.2	16.2%	147'3"	15'9 1/4"	13	2500	11	5 30 6HRS.	960	280	HOLLAND
N-4-7	4	331	385	14%	155'	14'7"	13	2500	11	5 30 6HRS.	600	280	LAKE
O-1-10	10	520	629.3	17.3%	172'4"	17'5 1/2"	14 2499	14 3000	10.5	8.5	900	380	HOLLAND
O-11-16	6	485	566	14.3%	175'	16'3 3/8"	14	14 3000	11	8.5 25.5	1000	380	LAKE
SCHLEY	3	1106	1487	25.6%	269'9"	22'2"	20 1440	14 3000	11.5	5 100 20HRS.	4000	760	SPEAR
107-104-122	15	854	1092	22%	231'	21'4 3/4"	15	11 5500	12 1/4	9.4 28.2	1400	740	C. + R.

CLASS	TYPE OF ENGINE	STORAGE BATTERY: TYPE	NO. OF CELLS	RATED CAPACITY 8 HR. RATE	TORPEDO TUBES BOW HULL / BOW SUPERSTR.	ARMAMENT	DEPTH OF HULL	DRAFT	REMARKS
A-2-7	1 OTTO 4 CYLINDER GASOLINE	GOULD-EXIDE 23-W-S	60	2250	1 B-H	3 T	13'	10'7"	SINGLE SCREW A 2-3 GOULD. A-3-23W OTHERS 23 W-S.
B-1-3	1 Craig 4 Cycle 6 cylinder Gasoline	Exide 23 W Paste	60	2800	2 B-H	4 T	15'	10'7"	SINGLE SCREW
C-1-5	2 CRAIG 4 C 6 Cylinder Gas.	"	120	2800	2 B-H	4T	16'	10'10 3/4"	TWIN SCREW
D-1-3	2 CRAIG 4 C. 6 Cylinder Gas.	"	120	2800	4 B-H	4T	15'2 5/8"	11'8"	–
E-1-2	NELSECO DIESEL 4C. 6 CYLINDER	GOULD 23 W. Plant Paste	120	3 hrs. 2820	4 B-H	4T		11'8"	BOW RUDDERS
F-1-3	F-1-2 NELSECO 4 C 8 Cyl F-3 - CRAIG DIESSEL	EXIDE PASTE	120	3 hrs. 3770	4 B-H	4T	16'10 1/2"	12'2"	F-1-3 NEW ENGINES INSTALLED
G-1	WHITE AND MIDDLETON 4C 6Cyl. Gas.	PLANT PASTE	120	3 hrs. 3840	2 B-H	2T	16'11.6"	12'6"	DROP KEEL DIVING COMPT. GROUND WHEELS FORE & AFT
G-2	GASOLINE	" "	120	3 hrs. 3840	2 B-H	3T	16'4"	13'7"	DROP KEEL
G-3	SULZER DIESSE 2C 6CYL.	" Bat "	120	4200-8HRS	2B-S2SS-2B-H	4T	16'4 3/16"	12'10"	SUPERST. DRAINS MOTOR GROUND WHEELS FORD
G-4	4 FIAT 4 C. 6 CYL. Gas.	PASTE	164	3 hrs. 7176	2 S.H. 2 B.H.	8 T.	15'1 3/8"	11'2.3/16"	–
H-1-3	NELSECO 2C. 6CYL.	EXIDE PASTE	120	3 hrs. 3808	4 B-H	8 T	17'2.5"	12'5"	–
K-1-8	NELSECO 2C. 8CYL.	GOULD PASTE	120	4000 3HRS.	4 BH.	8 T	18'3 1/16"	13'1"	–
L-1-4	" 2C. 6Cyl	GOULD 23W.L PLANT PASTE	120	3HRS. 4150	4 BH.	8T 3" GUN	19'	13'7"	BOW BALLAST TANKS.
L-5-8	BUSH-SULZER-DIESEL 2Cyl.	EXIDE 29-W PASTE	120	3HRS. 4050	4 BH	8T "	17'9 3/8"	13'3"	BUILT BY GOV'T. at PORTSMOUTH N.H.
M-1	NELSECO-M.A.N. 2Cyl. Crosshead	GOULD 27W.L. PASTE	120	3HRS. 4600	4BH.	8T	16'10 1/2"	11'	–
N-1-3	NELSECO-4C. 8CYL.	PLANTE PASTE	120	3HRS. 2970	4BH.	8T 3" GUN	17'1/4"	12'5 3/4"	–
N-4-7	BUSH-SULZER-DIESEL 2C. 6CYL.	EXIDE PASTE	120	3HRS. 3135	4BH.	8T. 1 MACH. GUN	16'6"	12'4"	–
O-1-10	NELSECO 4C. 6CYL.	PLANTE PASTE	120	918 KWH 3HRS.	4BH	8T. 3" GUN	19'9 3/4"	14'5"	INDIVIDUAL TUBE DOORS WITH BOWCAP
O-11-16	BUSH-SULZER-DIESEL 4C. 6CYL.	IRONCLADE "	120	942.4 KWH "	4BH	8T. "	18'3 1/2"	13'10 1/4"	"
SCHLEY	4 NELSECO 4C. 6Cyl	GOULD "	120		4BH	16T. 2-3" GUNS	21'8 7/8"	14'1"	–
107-104-122	NELSECO 4C. 2-8Cyl.	IRONCLAD	120	3HRS. 1240 K.W.H.	4BH	12T. 21" 3" GUN	19'6"		ALTISCOPE- HYDROPLANES FORD & APT.

Inspection of Submarines.

Station I. 3 hrs. time for inspection.

THE MAIN BALLAST.

Locate main ballast tanks, and state into how many parts main ballast is divided. Find out capacities of each main ballast tank. By what means are they flooded. Ascertain course of the flooding water whether through a seachest or direct through the sea valve.

Look up the vents whether inboard or outboard: state where they are; and how to ascertain whether tanks are completely flooded.

From where are the tanks blown? Trace the blow lines as completely as possible from source to entrance into tanks.

What means are used to pump the main ballast tanks, whether reciprocating or rotary pumps, and how many.

Trace the course of the water from main ballast tanks to the pumps, and look up the overboard discharge from the pumps. (In looking up the lines ascertain their approximate position if you can not see them; but be sure that you can always imagine the course of the water as a continuous whole to the overboard discharge.

Station II. Time 5 hrs.

SECONDARY BALLAST AND TRIM TANKS.

Locate all trim and secondary ballast tanks and their capacities. How flooded, vented and blown; also trace the lines for flooding and venting. Are these tanks vented inboard or outboard?

Can these tanks be pumped? Trace the pumping of these tanks overboard. What is the pump used for pumping these tanks called. Can you pump from the forward trim to adjusting and vice versa? From after trim to adjusting and vice versa? Is it possible to pump from any of the trim and secondary ballast tanks with the main ballast pumps?

Station III.

TRIMMING LINES.

Examine the adjusting manifold and state what connections it makes. Trace the trimming line and full length of the boat and state what tanks it serves. What manifolds do you find on the trimming line besides the adjusting manifold? Is the trimming line used for pumping or blowing through of fuel oil? Where is the connection made from the trimming line, so that fuel oil tanks can be flooded with water. Can you pump the fuel oil tanks with the adjusting pump from forward to aft and vice versa? How many ways can the fuel tanks have their oil transfered between them in the forward group. In the after group.

Is there a separate system for the fuel tanks whereby they may be filled and blown through? Is this one continuous system for the fuel tanks forward and aft; or is it necessary to use the trimming line for transferring oil from the foward part of the boat, and vice versa?

Station IV. 5 hrs.

THE COMPRESSED AIR SYSTEM.

Where is the high pressure air stored; in how many banks and at what pressure? Trace the main high pressure air lines. State how the main air line receives its air from the air banks. Assuming that the air line is open to an air bank, trace the course of the air to the air manifold stating what changes of pressure it undergoes and what means are used to reduce the pressure of the incoming air. What is the purpose of the 100 lbs. volume tank.

What is the automatic blow and what tanks does it serve. Look up how the automatic blow valve receives its air for blowing; also the line whereby the air reaches the tanks. Can one tank only be blown with the automatic blow?

Station V.

HAND PUMPS. CONNING TOWER.

Where are the hand pumps located? Out of what tanks can they take a suction and have they independent suction lines to these tanks; also can they take a suction from the trimming line. Where is the discharge overboard to the hand pumps?

How is the conning tower fitted up as an escape lock in case of emergency.

Can the outboard hatch of the tower be opened or closed from the interior of the boat, and where is the mechanism for this purpose situated. When used as an escape lock, to where does the water drain out of the tower.

Station VI.

MISCELLANEOUS.

State what kind of submarine signalling apparatus is used whether submarine bell or oscillator. Where are these situated? If submarine bell, explain how operated.

How many periscopes, and what type; stating whether a walk-around type and what make? Is it a housing type?

Describe the salvage system on the boat. Is it possible to put an air pressure on any compartment from the central control station?

Station VII.

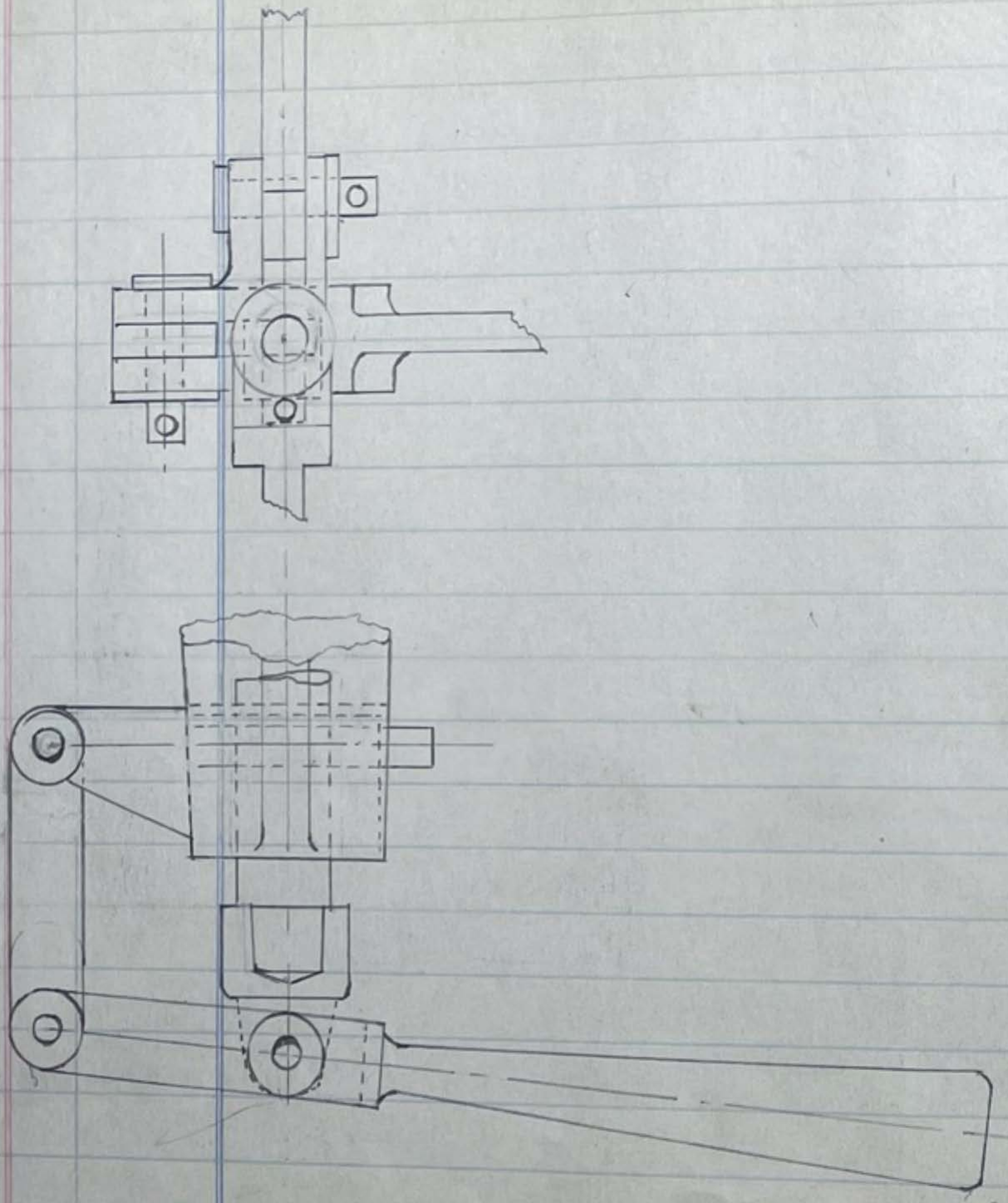
ORDNANCE.

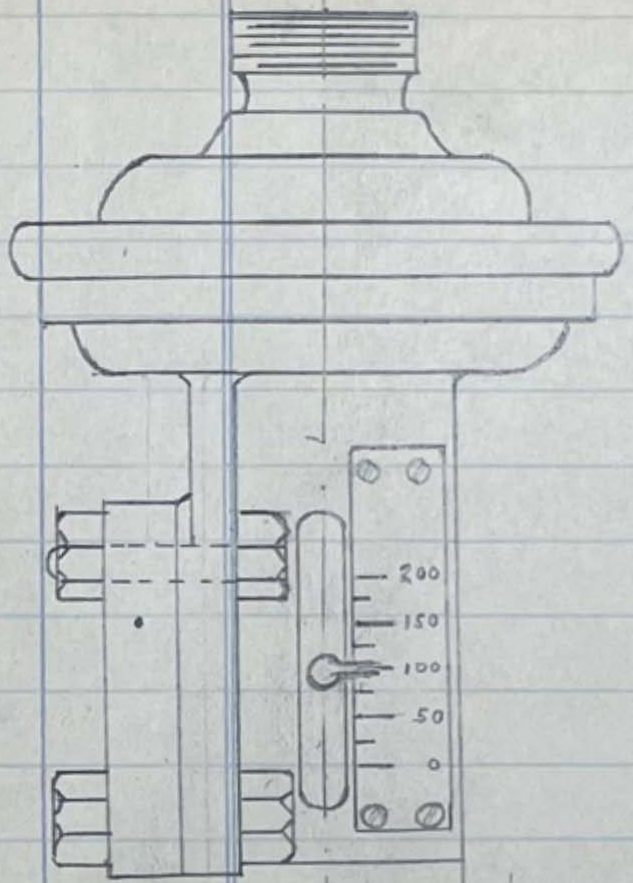
Find out how the muzzles of the torpedo tubes may be opened for discharge of torpedo. What is the interlocking gear for; explain briefly its operation. How may the torpedo tubes be flooded? State the vents and blow lines to the tubes.

Trace the air from source to tube for firing torpedoes. What pressure is maintained in the expulsion tank when firing? Why is the expulsion air system on the 200 lbs. line? Is there any difference in weight when the tubes are flooded

with water and when the torpedoes are in the tubes ready for firing with tube muzzles open to sea.

What precaution must be taken when a torpedo is in a tube?

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