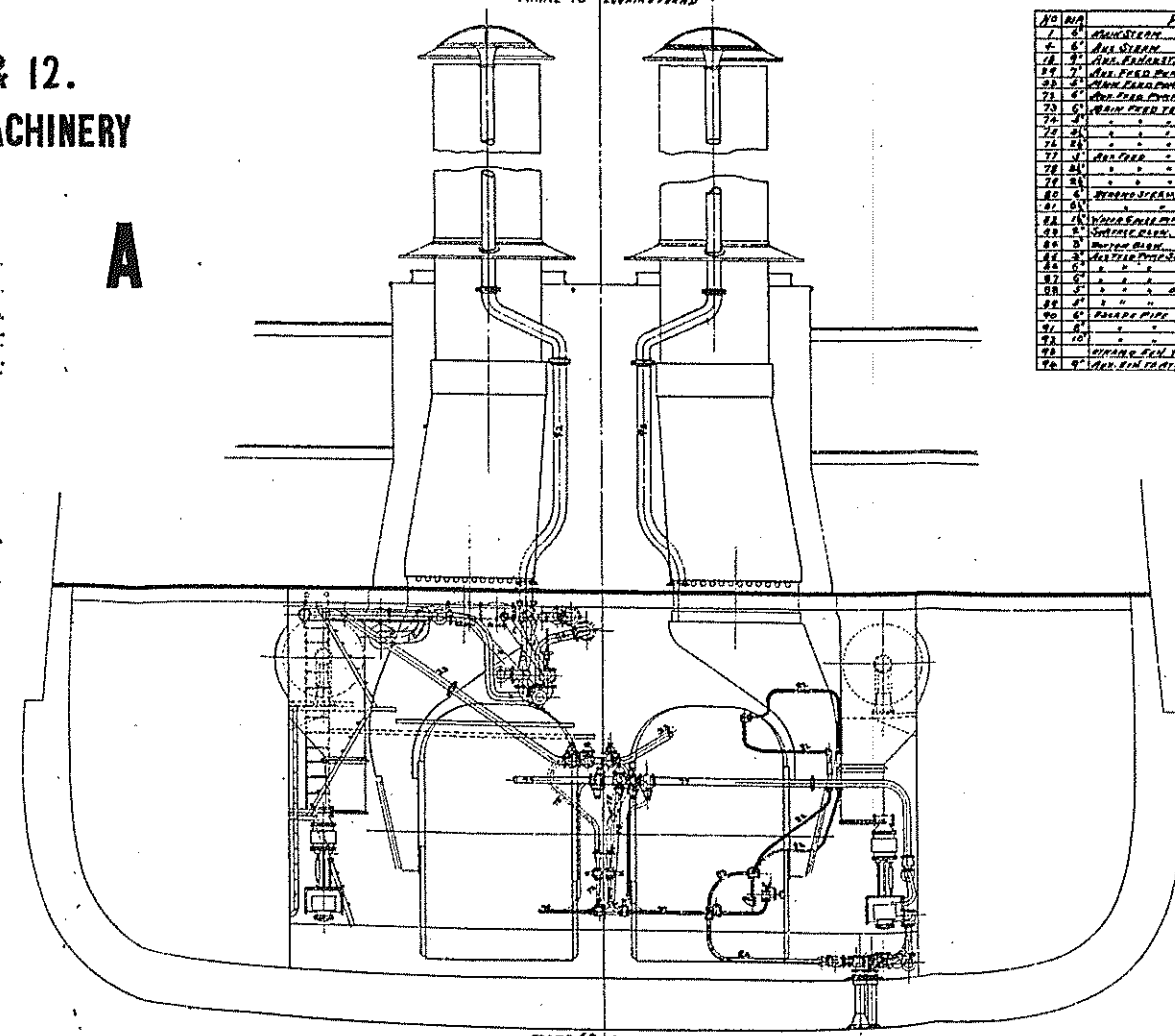
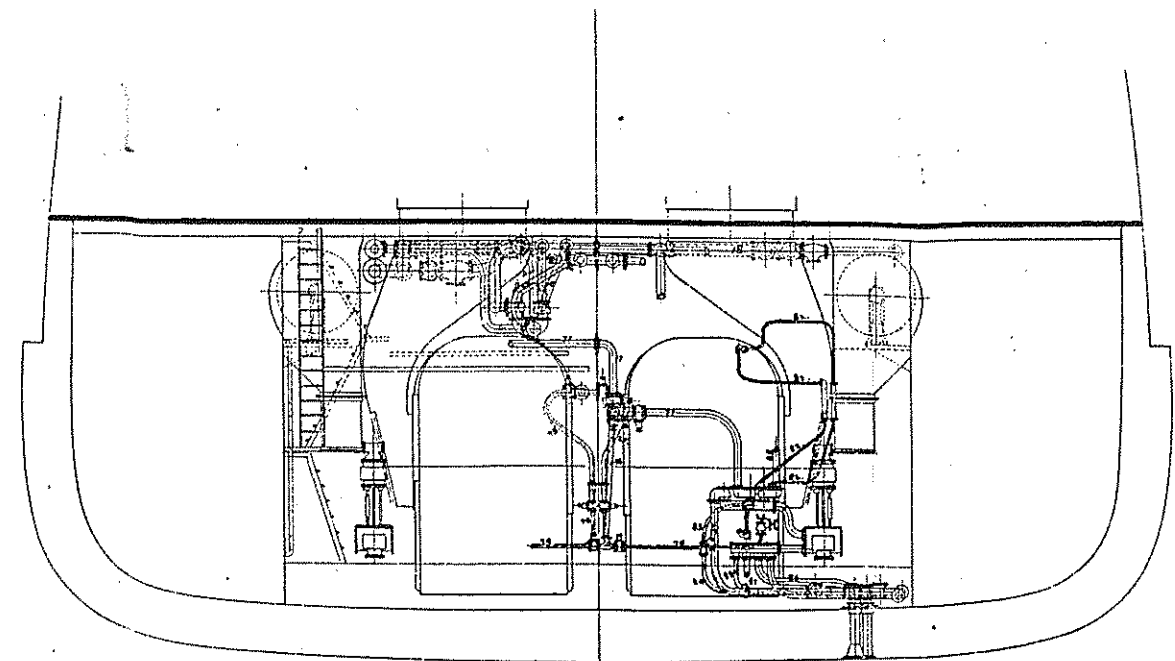


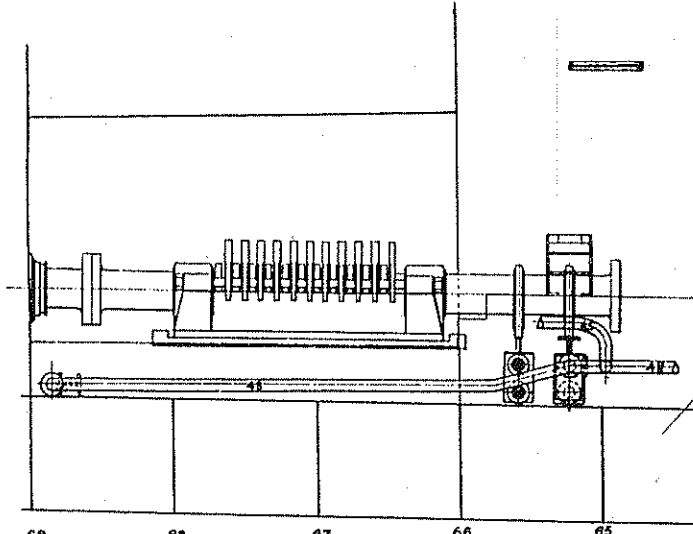
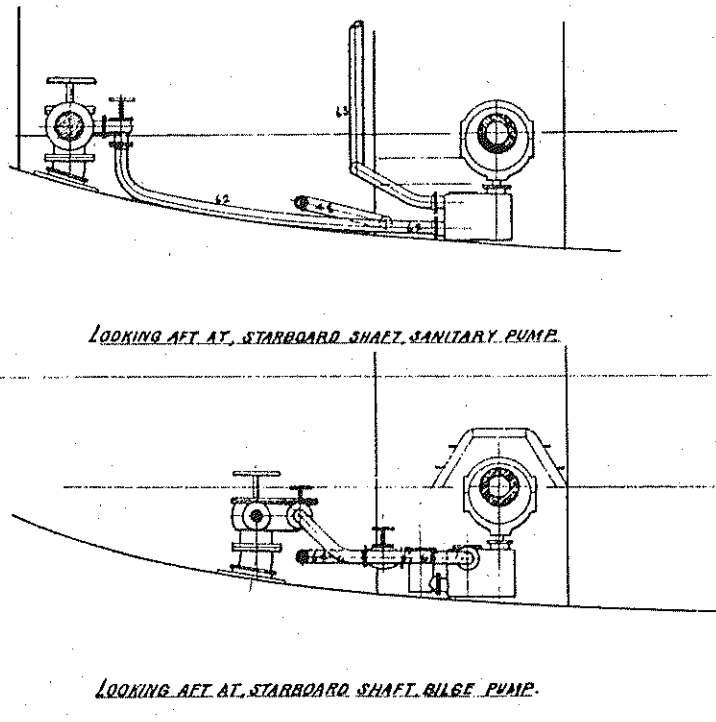
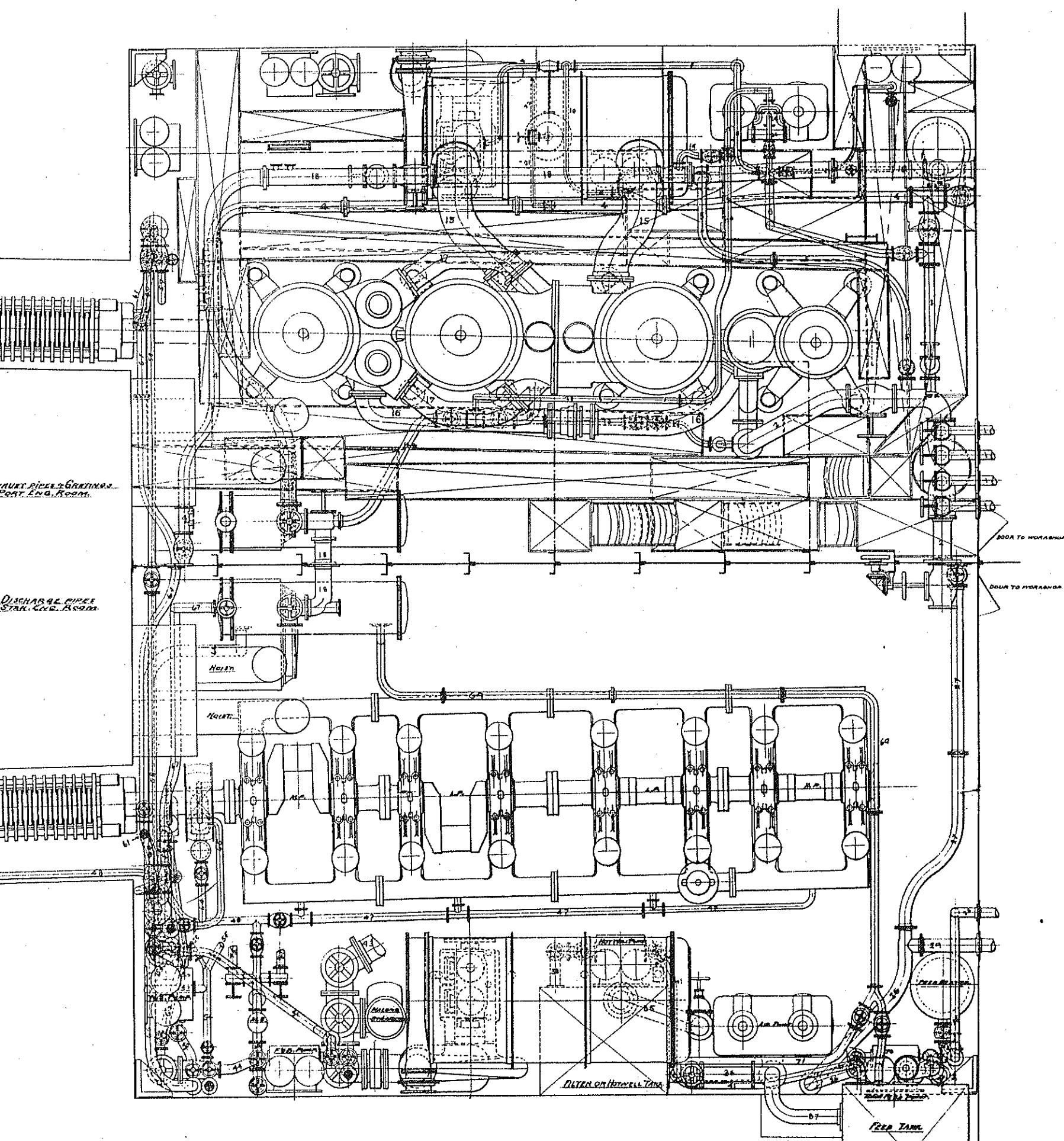
**BATTLE SHIPS NOS. 10, 11 & 12.
GENERAL ARRANGEMENT OF MACHINERY
IN BOILER ROOMS.**

TWIN SCREW.....TWO ENGINES.
DISPLACEMENT.....11,500.
IHP.....10,000.
DIAM. OF CYLINDERS.....30 1/2 x 35 3/4.
STROKE.....48'.
SCALE.....1"=1'

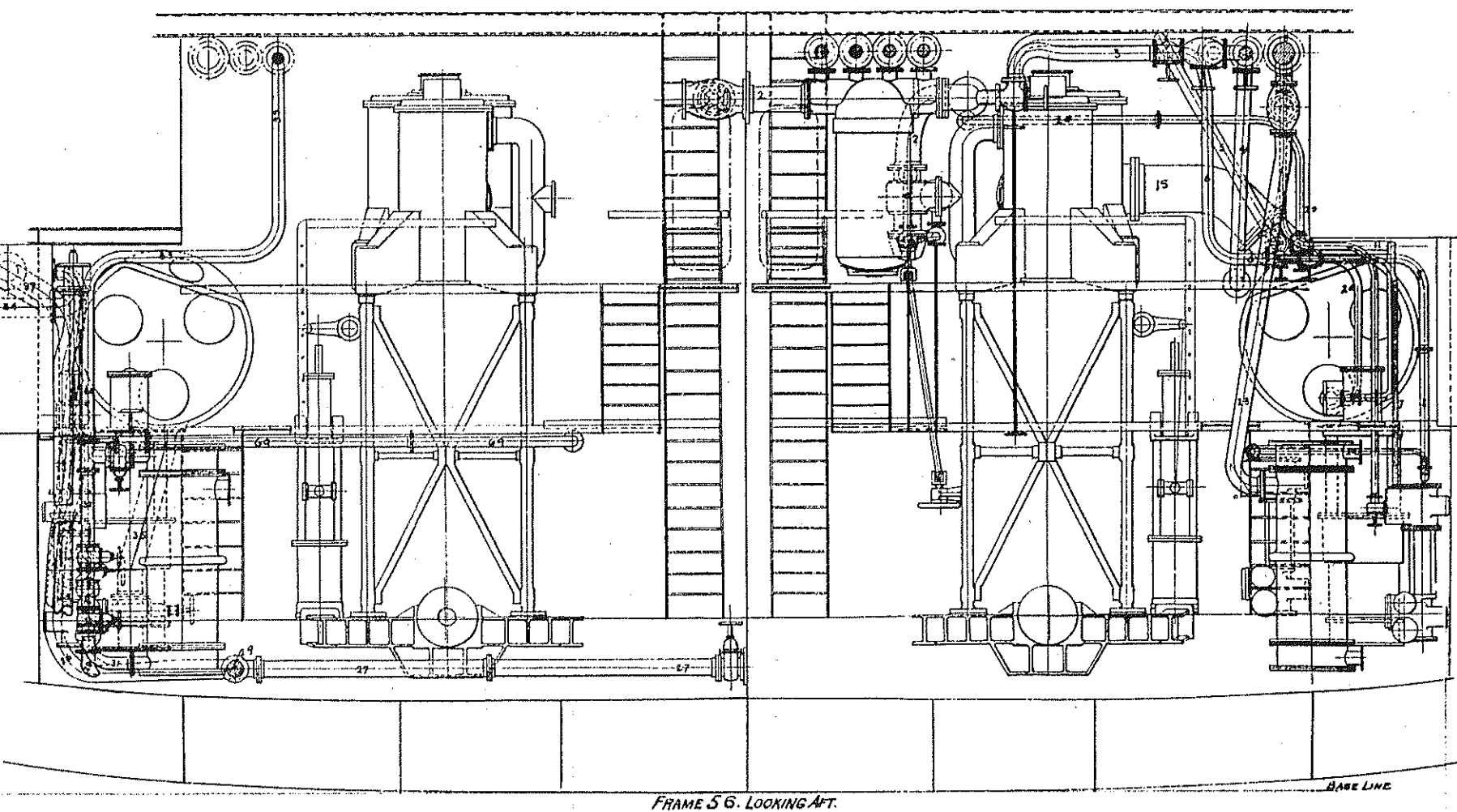
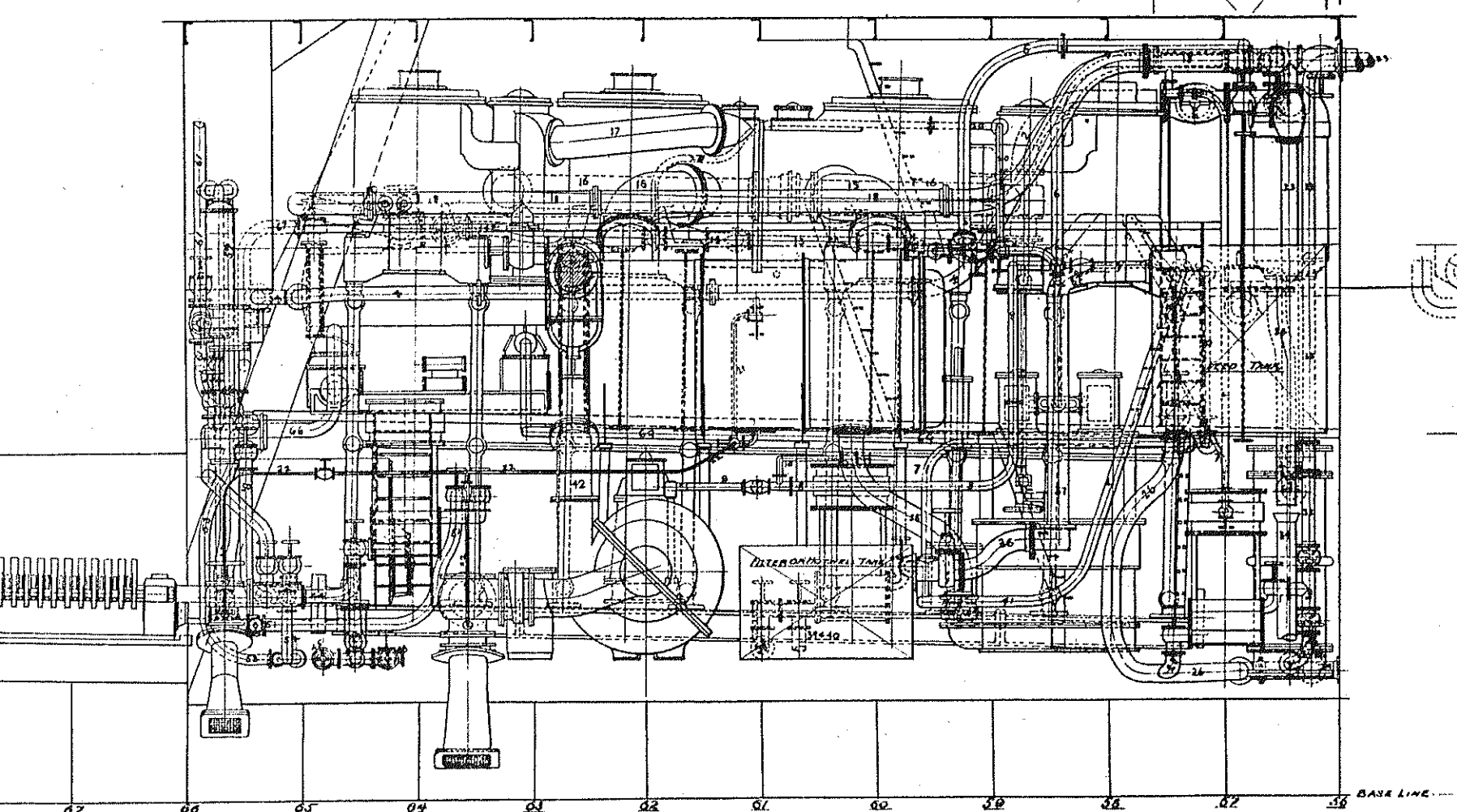
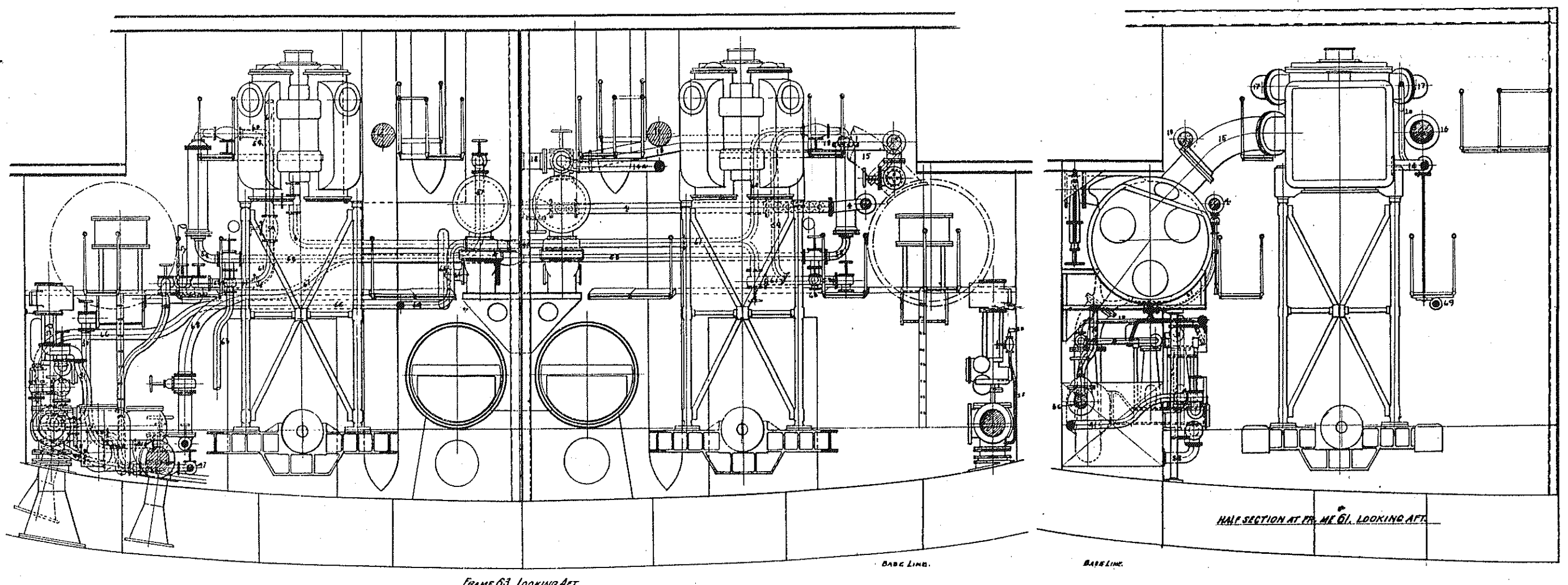
DeWitt
ENGINEER-IN-CHIEF, U. S. N.
CHIEF OF BUREAU OF STEAM ENGINEERING.



NO.	DESCRIPTION	PURPOSE
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No.	Di.	PURPOSE.	No.	Di.	PURPOSE.	No.	Di.	PURPOSE.
1	1	MAIN STEAM FROM BOILER	25	8	PIPE CONNECTING FEED TANKS	47	5	FEED PUMP
2	1	"	26	7	"	48	5	"
3	1	PIPE CONNECTING FEED TANK STEAM PIPES	27	7	"	49	5	"
4	1	AUX. STEAM EXH. ROOM CIRCUIT	28	6	MAIN FEED PUMP UNIT FROM TANKS	50	5	"
5	1	"	29	5	"	51	5	"
6	1	"	30	5	"	52	5	"
7	1	"	31	5	"	53	5	"
8	1	"	32	5	"	54	5	"
9	1	"	33	5	"	55	5	"
10	1	"	34	5	"	56	5	"
11	1	"	35	5	"	57	5	"
12	1	"	36	5	"	58	5	"
13	1	"	37	5	"	59	5	"
14	1	"	38	5	"	60	5	"
15	1	"	39	5	"	61	5	"
16	1	"	40	5	"	62	5	"
17	1	"	41	5	"	63	5	"
18	1	"	42	5	"	64	5	"
19	1	"	43	5	"	65	5	"
20	1	"	44	5	"	66	5	"
21	1	"	45	5	"	67	5	"
22	1	"	46	5	"	68	5	"
23	1	"	47	5	"	69	5	"
24	1	"	48	5	"	70	5	"

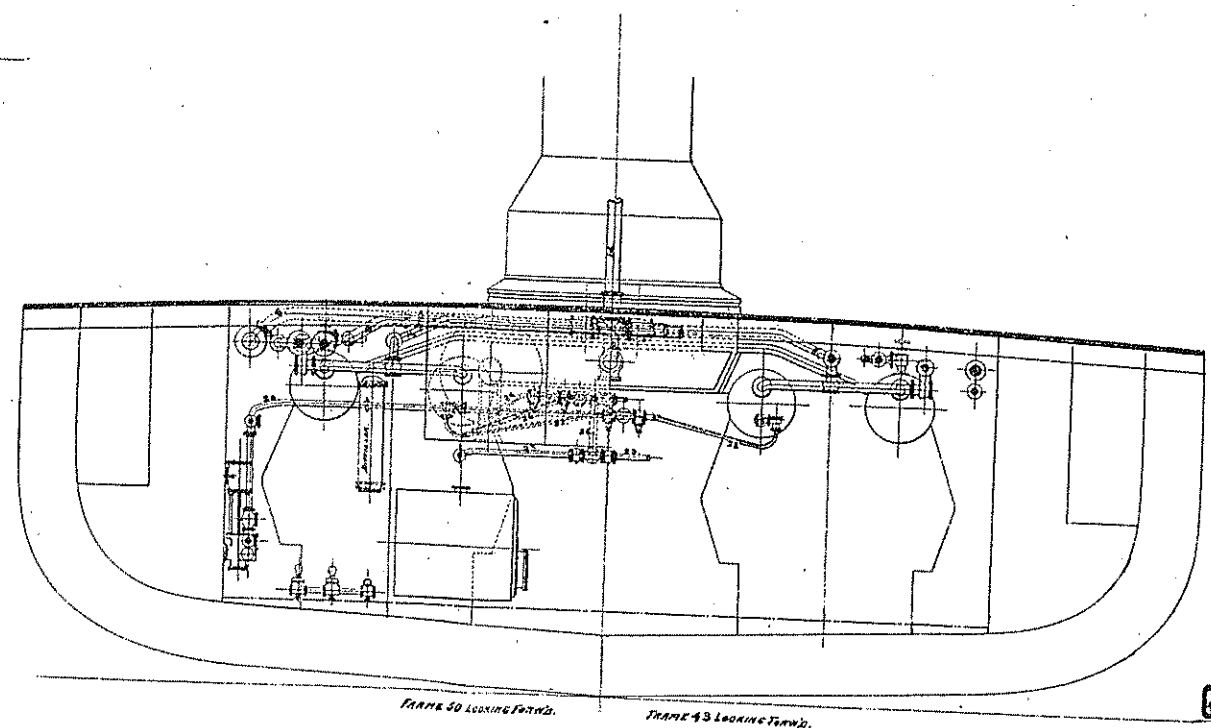
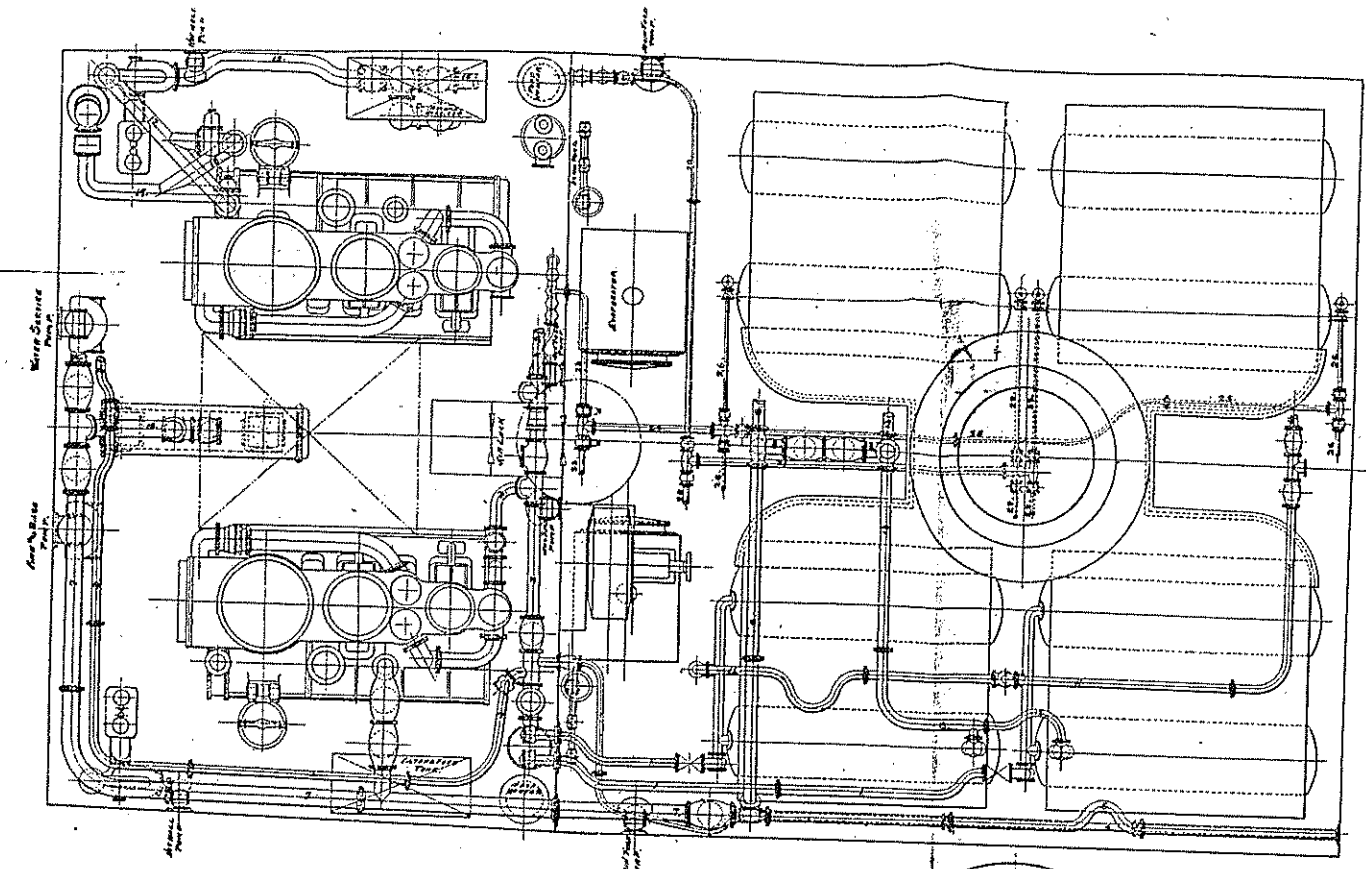


**BATTLE SHIPS NOS. 10, 11 & 12.
GENERAL ARRANGEMENT OF MACHINERY
IN ENGINE ROOMS.**

TWIN-SCREW..... TWO ENGINES
DISPLACEMENT..... 11,500.
IHP..... 10,000.
DIAM. OF CYLINDERS..... 30" 46 1/2 53 1/2
STROKE..... 4' 8"
SCALE..... 1"=1'

B

See M. Metcalf
ENGINEER-IN-CHIEF, U. S. N.
CHIEF OF BUREAU OF STEAM ENGINEERING.

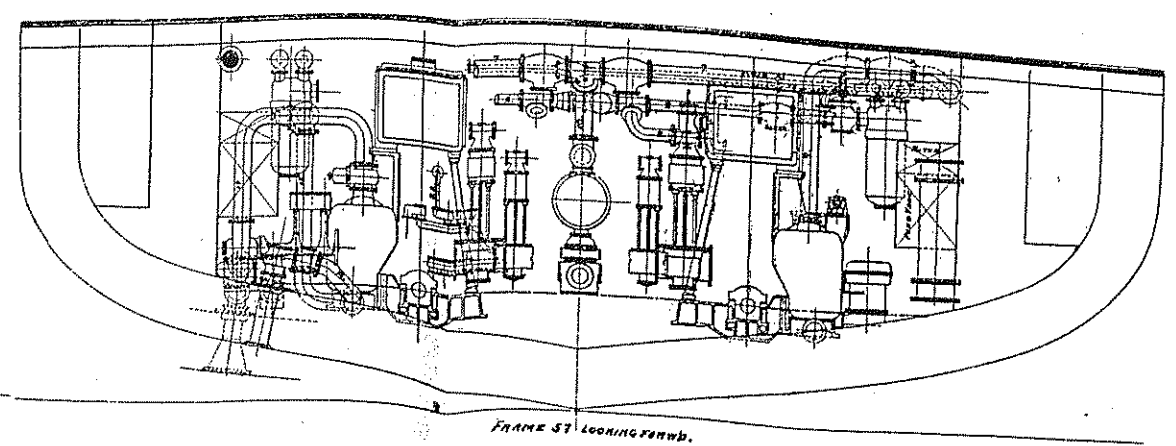
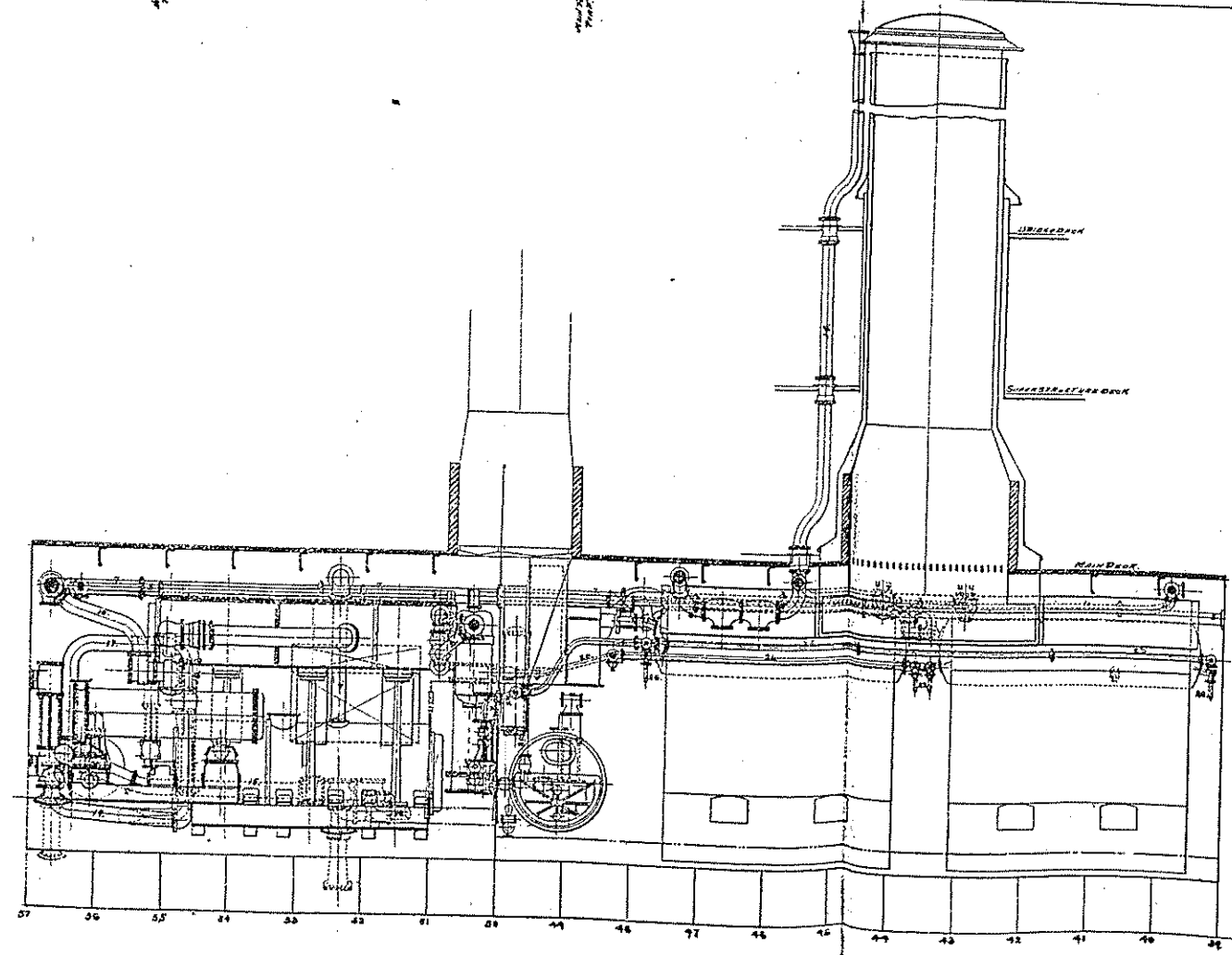


No.	Description	Purpose
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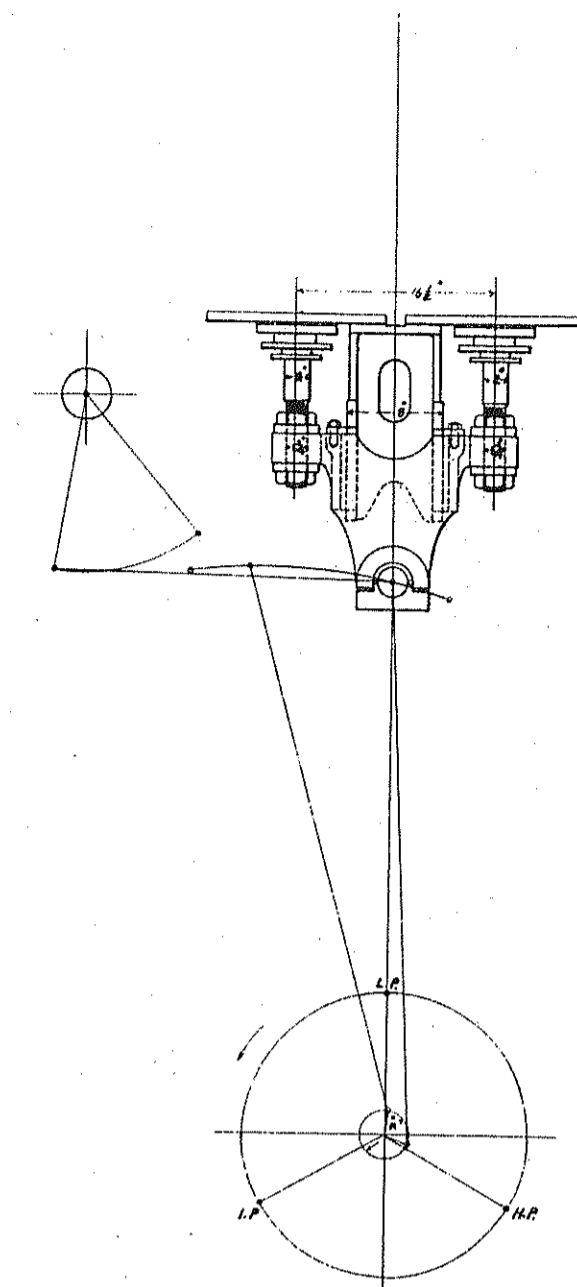
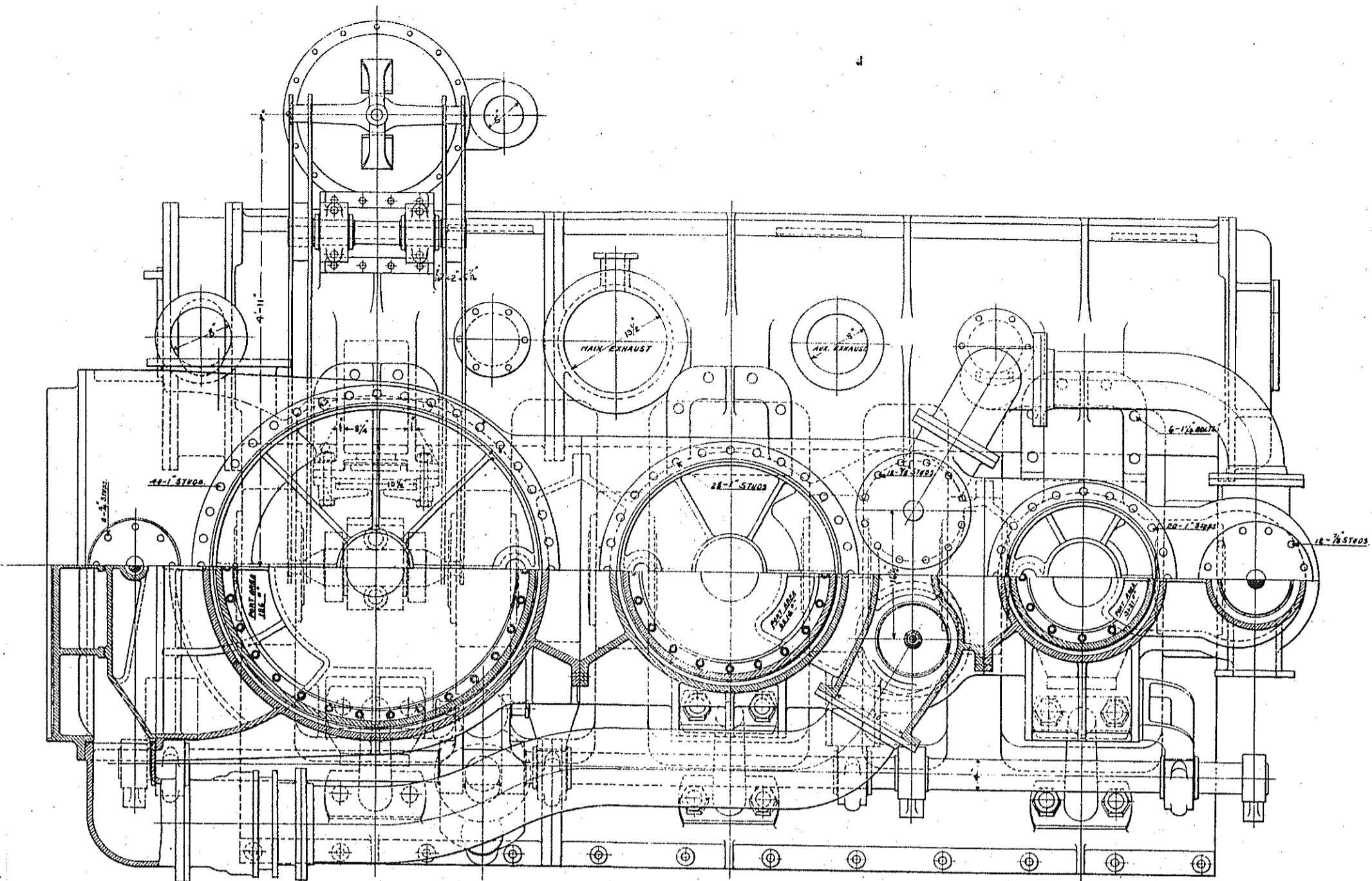
**HARBOR DEFENSE MONITORS
NOS. 7, 8, 9 & 10.
GENERAL ARRANGEMENT OF MACHINERY.**

TWIN SCREW.....TWO ENGINES.
 DISPLACEMENT.....2700.
 IHP.....2400.
 DIAM. OF CYLINDERS.....17' 20 1/2" 40"
 STROKE.....24"
 SCALE.....1" = 1'

A



DeWitt
 ENGINEER-IN-CHIEF, U. S. N.
 CHIEF OF BUREAU OF STEAM ENGINEERING.

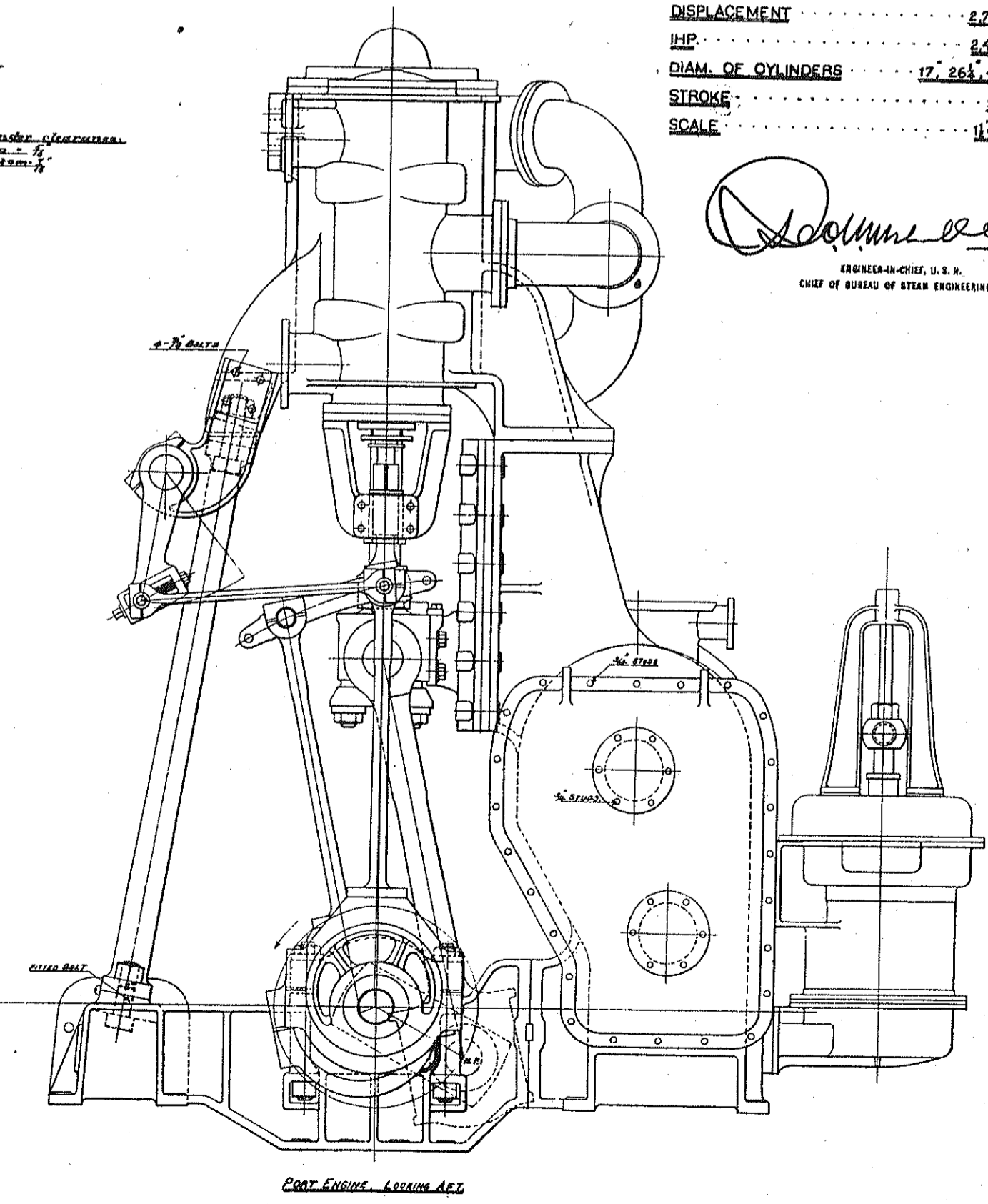
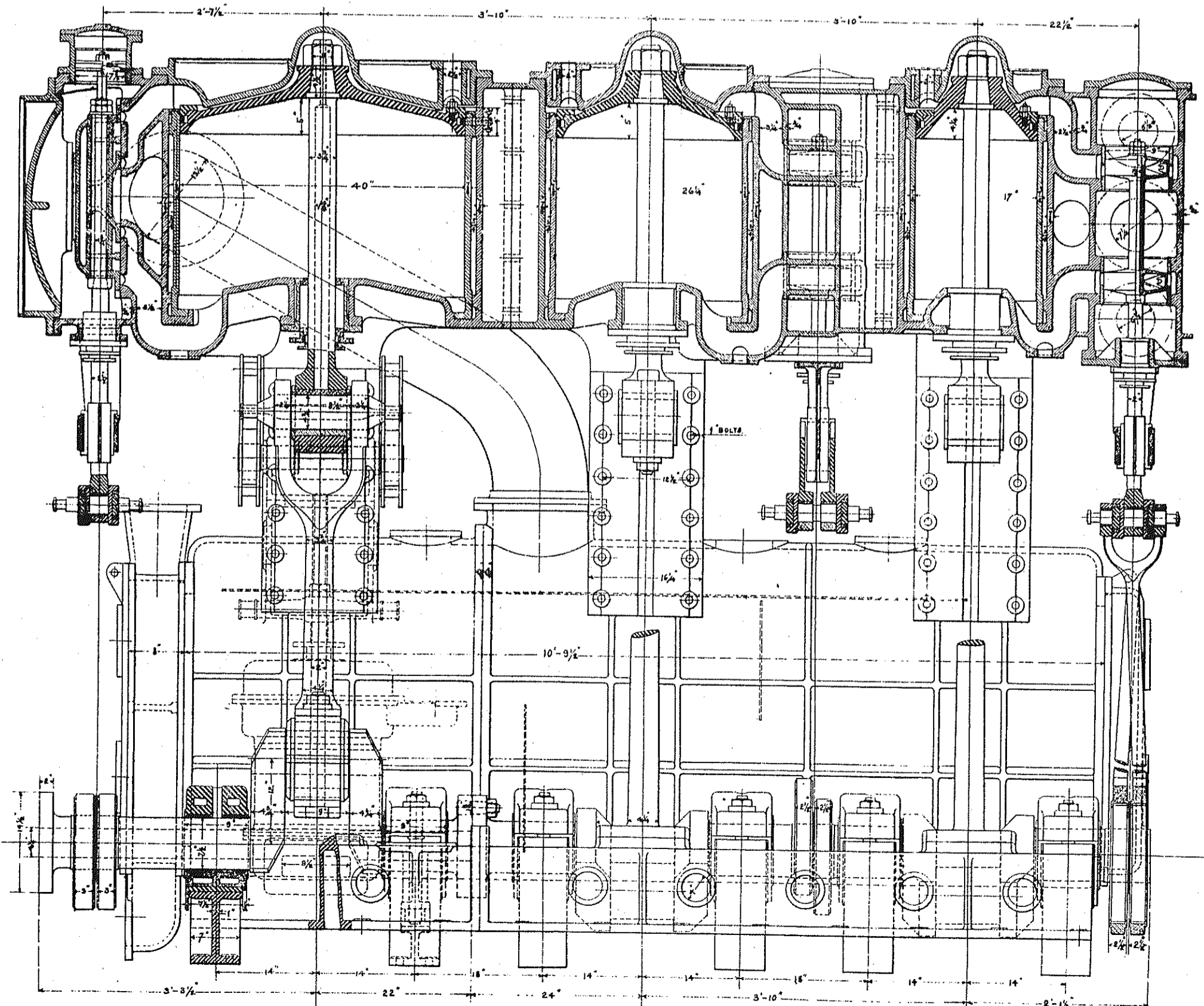
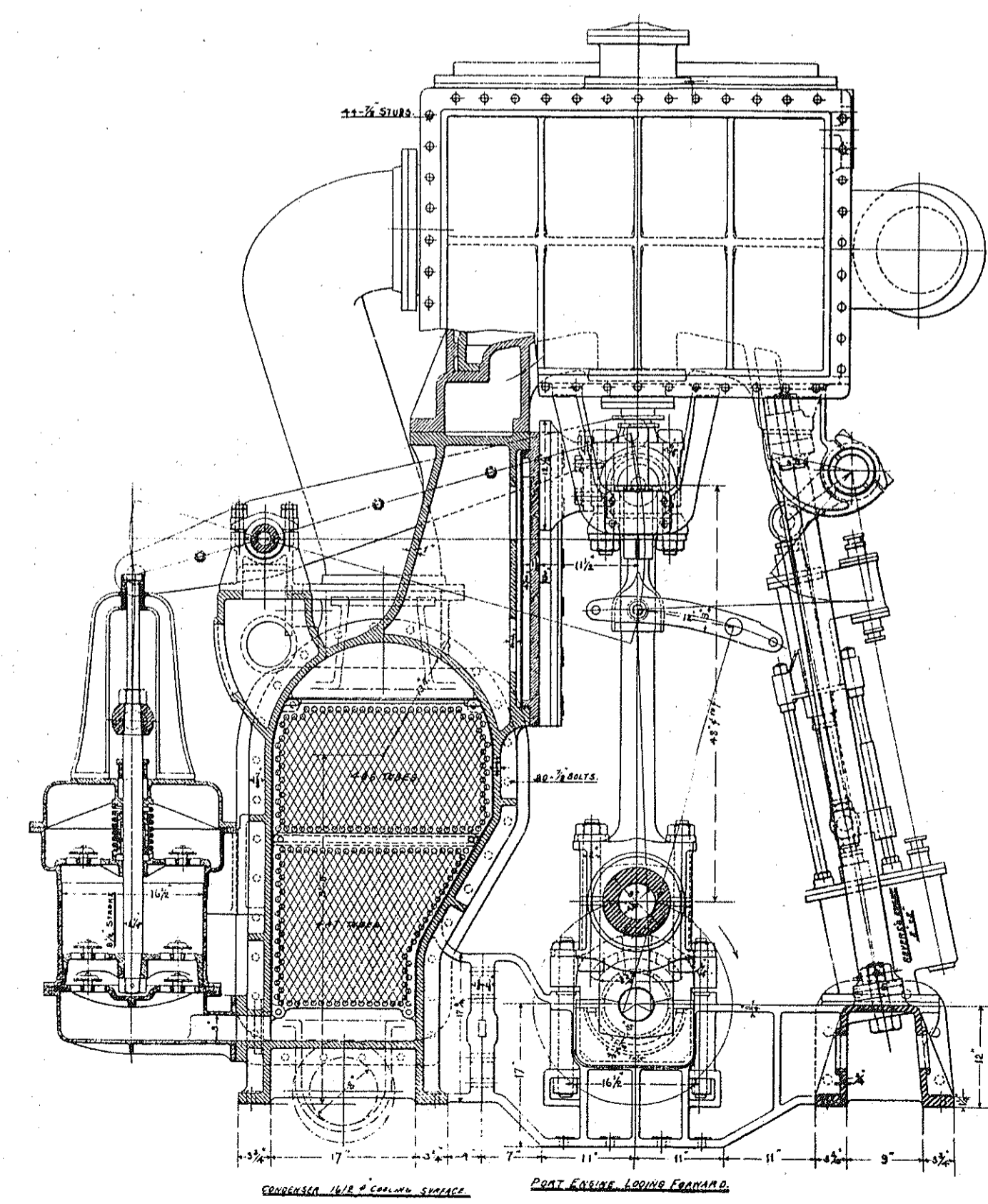


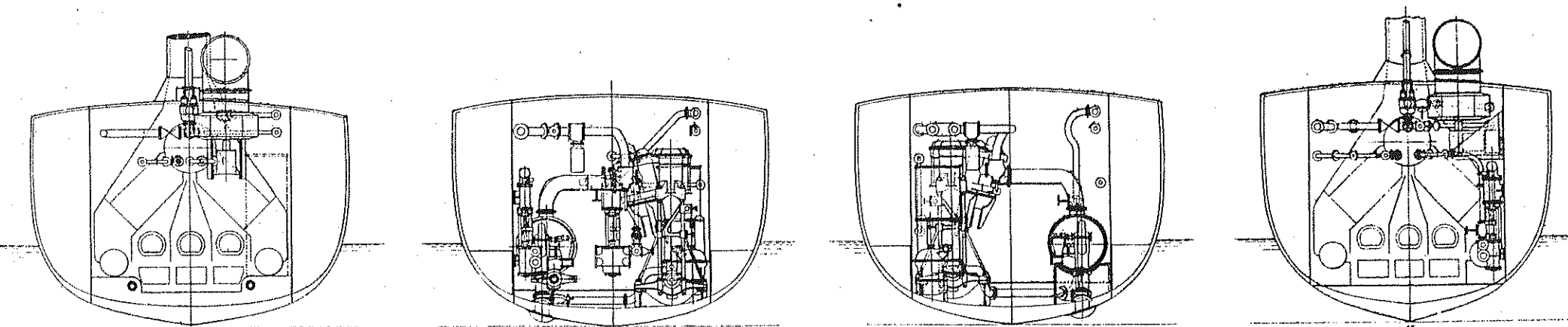
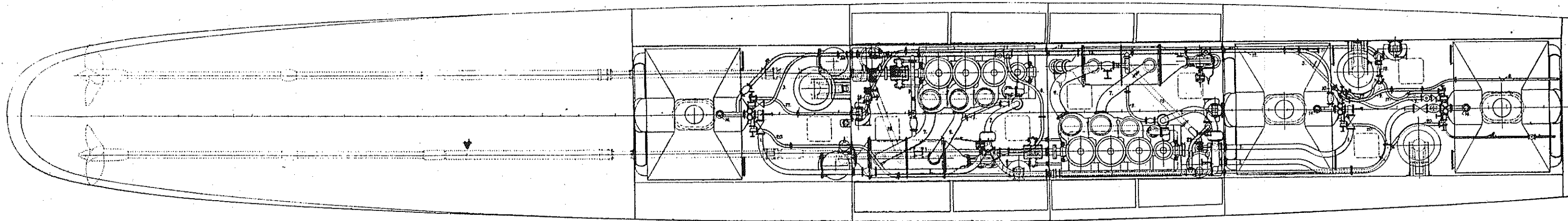
**HARBOR DEFENSE MONITORS
NOS. 7, 8, 9 & 10.
ARRANGEMENT OF ENGINES.**

TWIN-SCREW	TWO ENGINES
DISPLACEMENT	2,700
I.H.P.	2,400
DIAM. OF CYLINDERS	17, 26 1/2, 40
STROKE	24
SCALE	1"=1'

Edmund
ENGINEER-IN-CHIEF, U.S.N.
CHIEF OF BUREAU OF STEAM ENGINEERING.

TWO THUS (ONE IS DRAWN
ONE TO OPPOSITE HAND



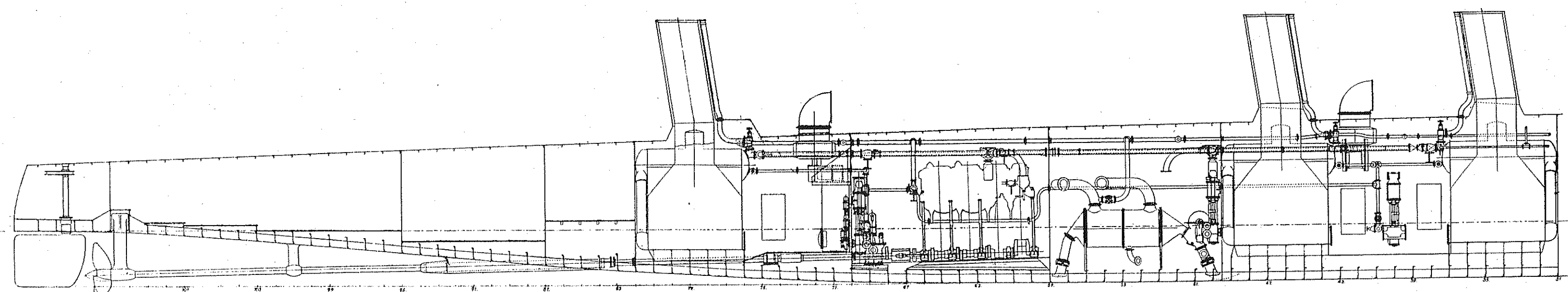


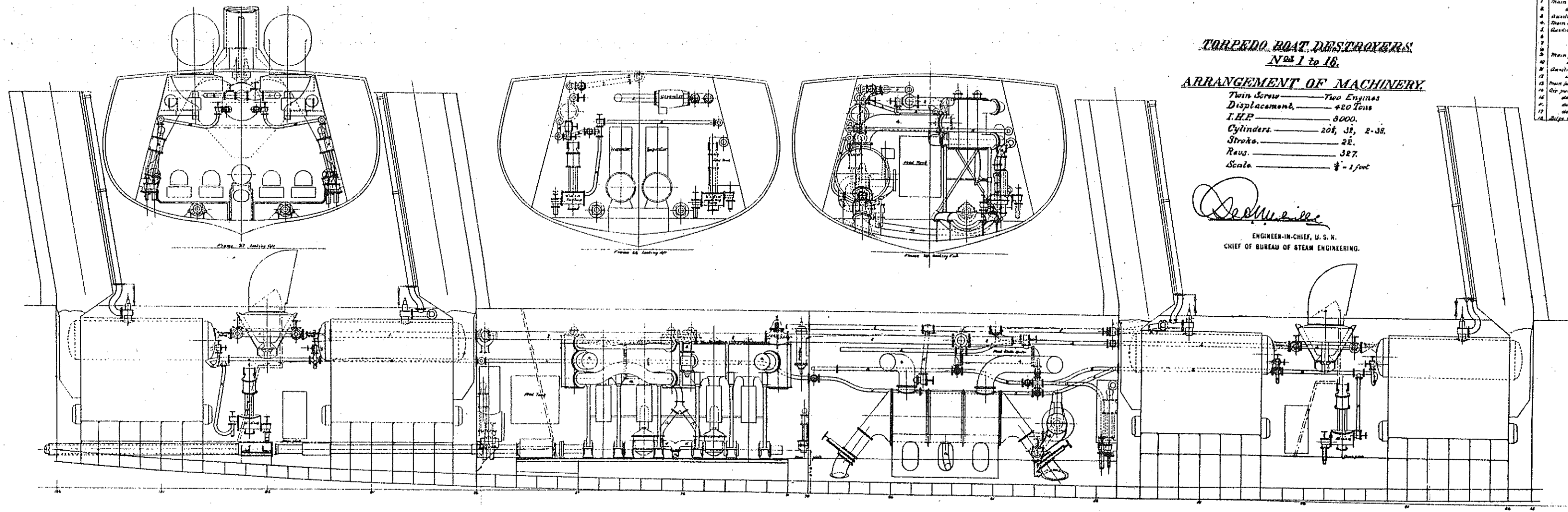
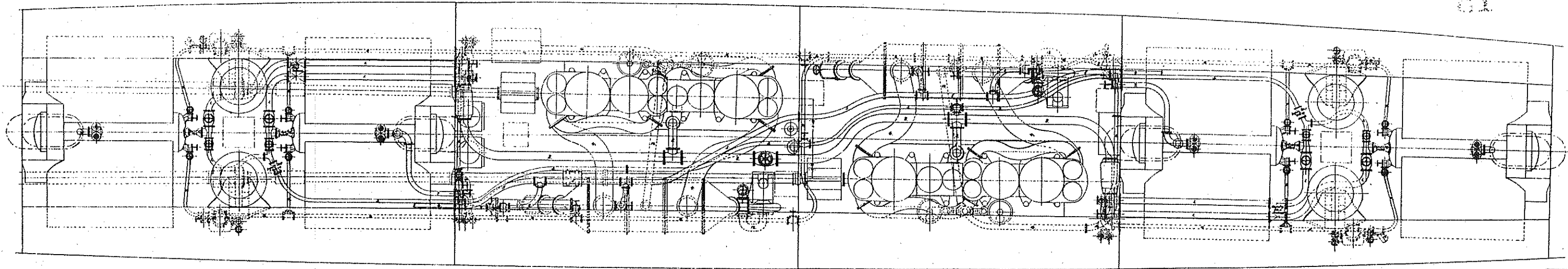
**TORPEDO BOATS NOS. 24-35.
GENERAL ARRANGEMENT OF MACHINERY.**

TWIN SCREW TWO ENGINES.
 DISPLACEMENT 165.
 I.H.P. 3000.
 DIAM. OF CYLINDERS 14", 22", 25 1/2", 25 1/2".
 STROKE 18".
 SCALE 1"=1'.

No.	Dia.	Purpose
1	14"	Main Steam from Boilers
2	14"	do do
3	14"	Auxiliary Steam from Boilers
4	14"	do do
5	14"	Water from Main Engine Steam Pipes
6	14"	Mixing Pipe to Condensers
7	14"	Auxiliary Steam to Forward Machinery
8	14"	do do
9	14"	Water Exhaust to Condensers
10	14"	Auxiliary Exhaust from Forward Machinery
11	14"	do do
12	14"	do do
13	14"	do do
14	14"	do do
15	14"	do do
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Deane
 ENGINEER-IN-CHIEF, U. S. N.
 CHIEF OF BUREAU OF STEAM ENGINEERING.





**TORPEDO BOAT DESTROYERS
Nos 1 to 16.**

ARRANGEMENT OF MACHINERY.

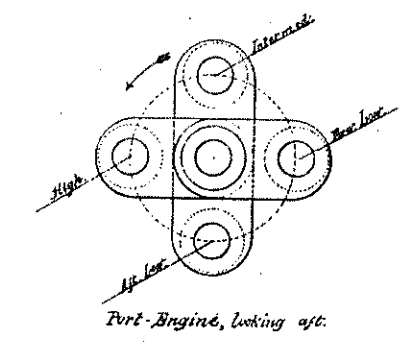
Twin Screw — Two Engines
 Displacement — 420 Tons
 I.H.P. — 3000.
 Cylinders — 20 $\frac{1}{2}$, 3 $\frac{1}{2}$, 2-3 $\frac{1}{2}$.
 Strokes — 2 $\frac{1}{2}$.
 Revs. — 327.
 Scale — $\frac{1}{8}$ - 1 foot

D. M. Miller
 ENGINEER-IN-CHIEF, U. S. N.
 CHIEF OF BUREAU OF STEAM ENGINEERING.

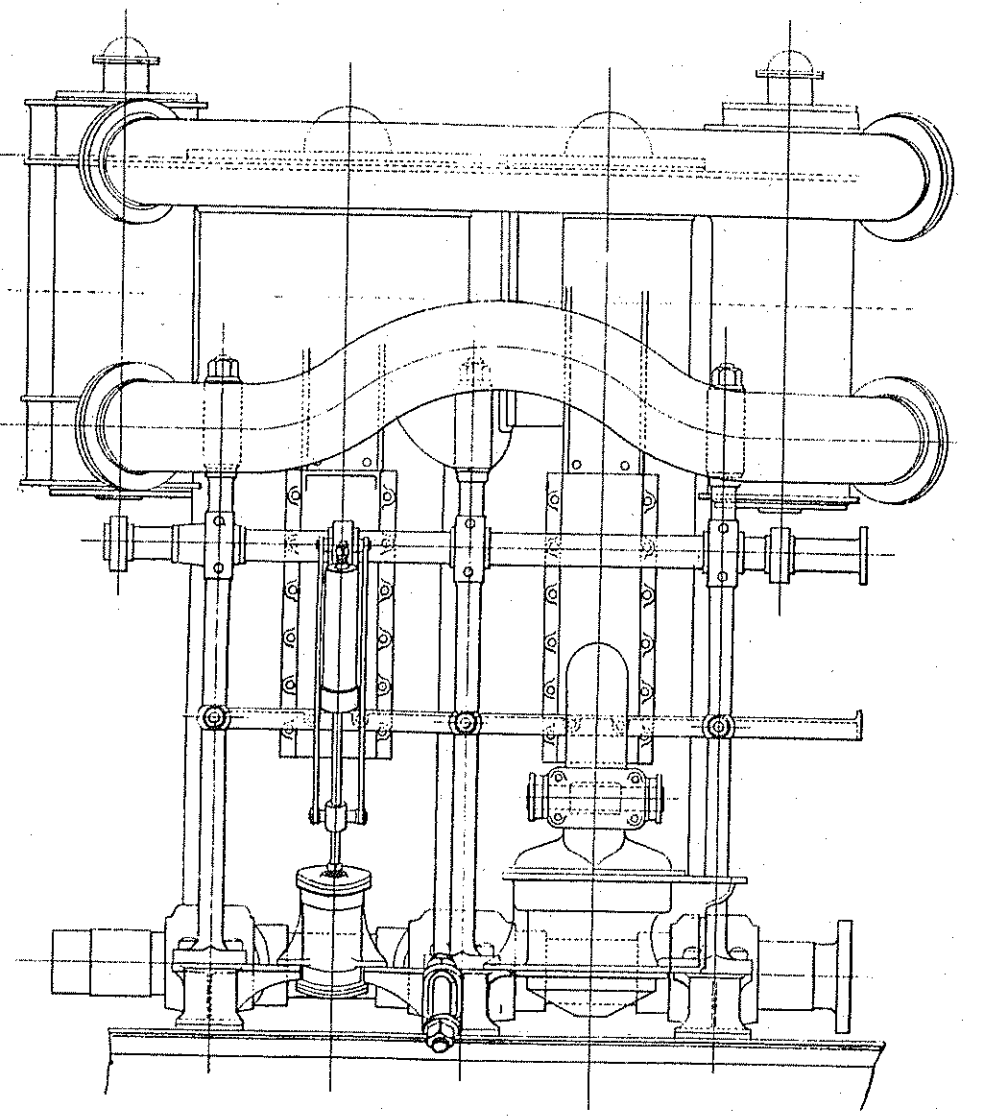
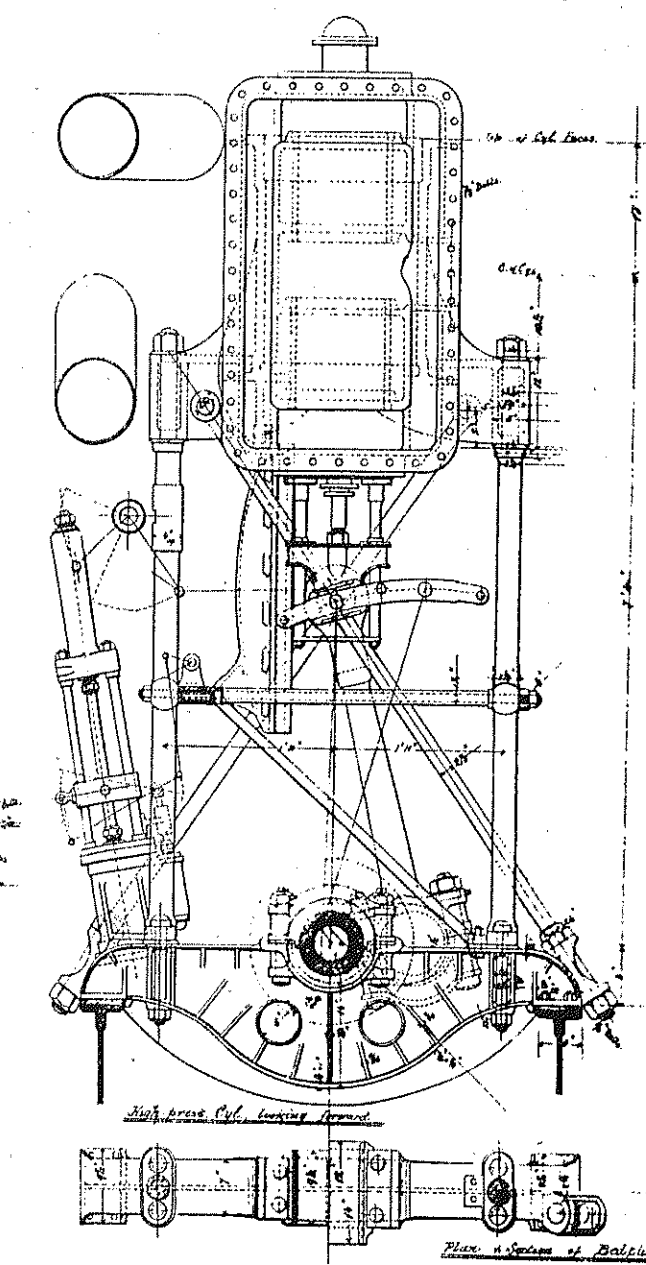
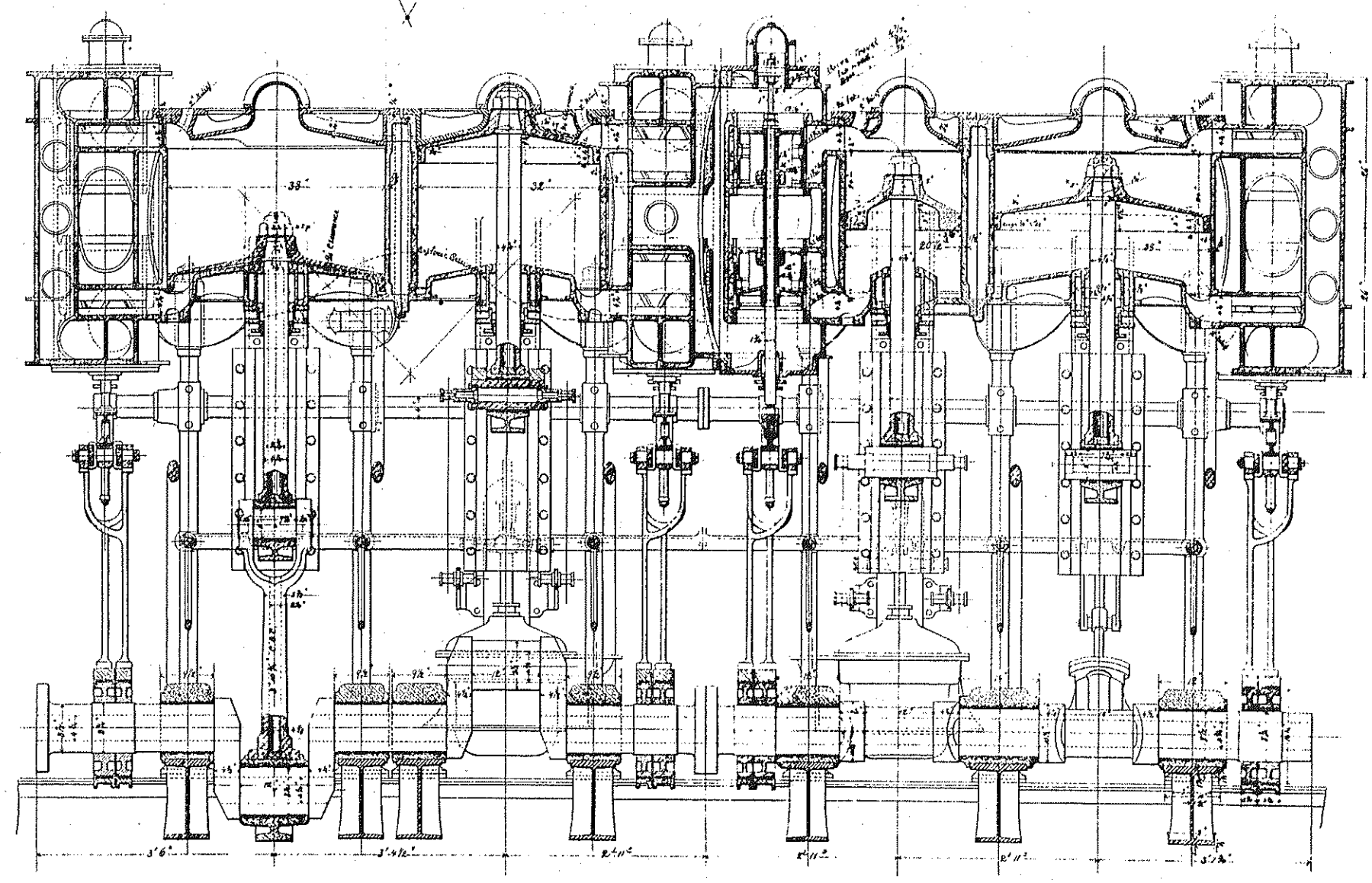
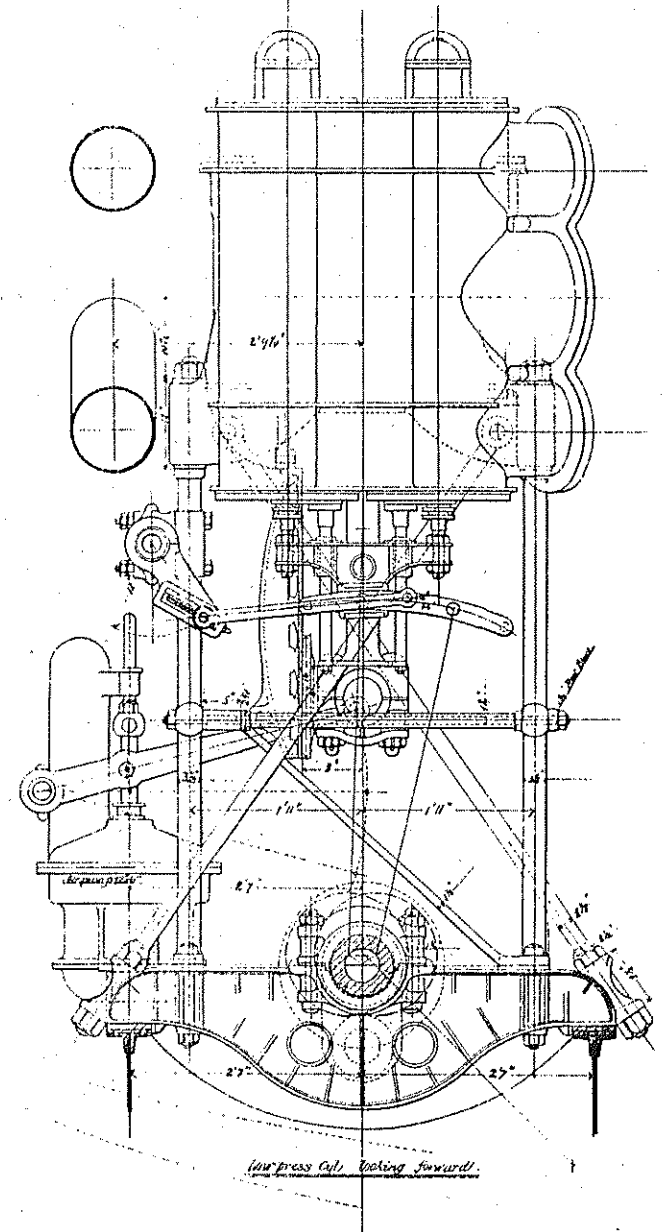
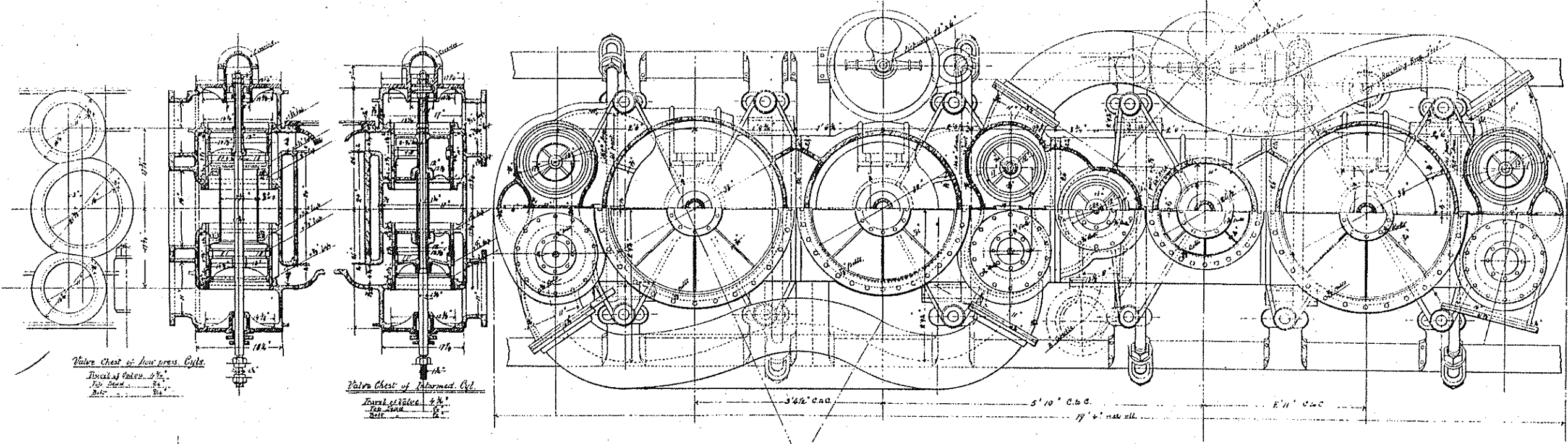
No.	Description	Size
1	Main steam from Boiler	3 $\frac{1}{2}$ "
2	do do	3"
3	do do	2 $\frac{1}{2}$ "
4	do do	2"
5	do do	1 $\frac{1}{2}$ "
6	do do	1 $\frac{1}{2}$ "
7	do do	1 $\frac{1}{2}$ "
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100	do do	1 $\frac{1}{2}$ "

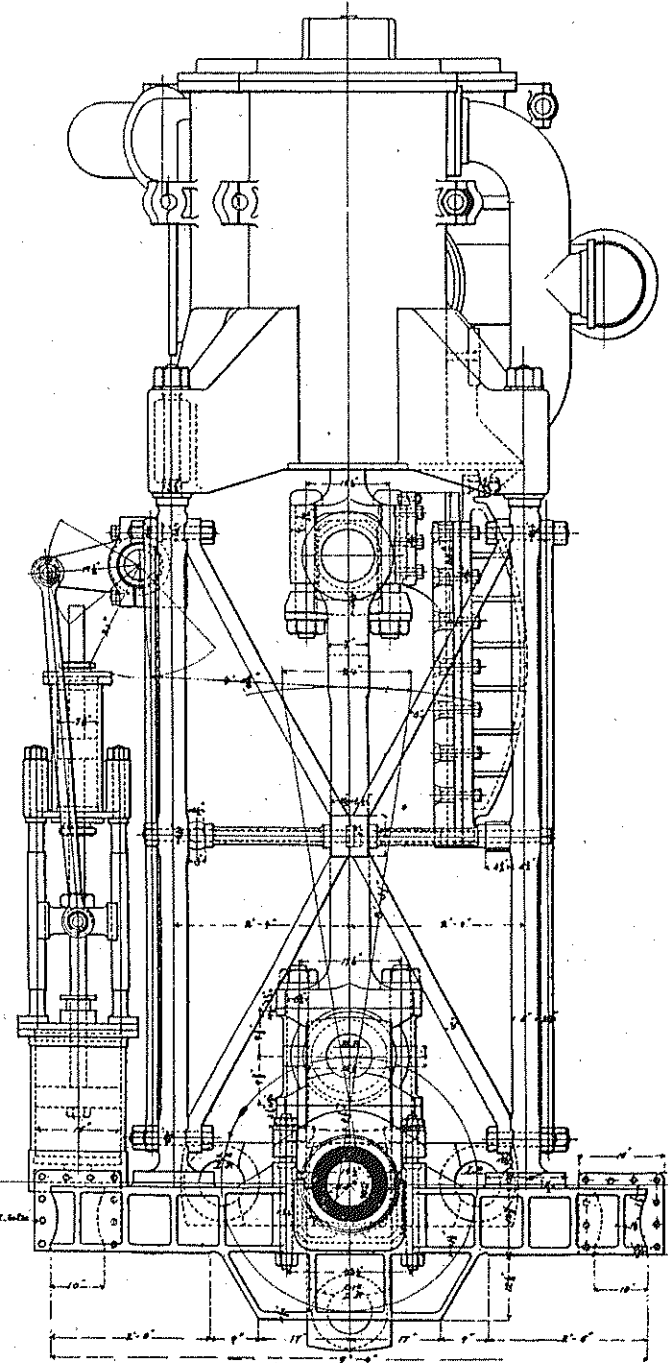
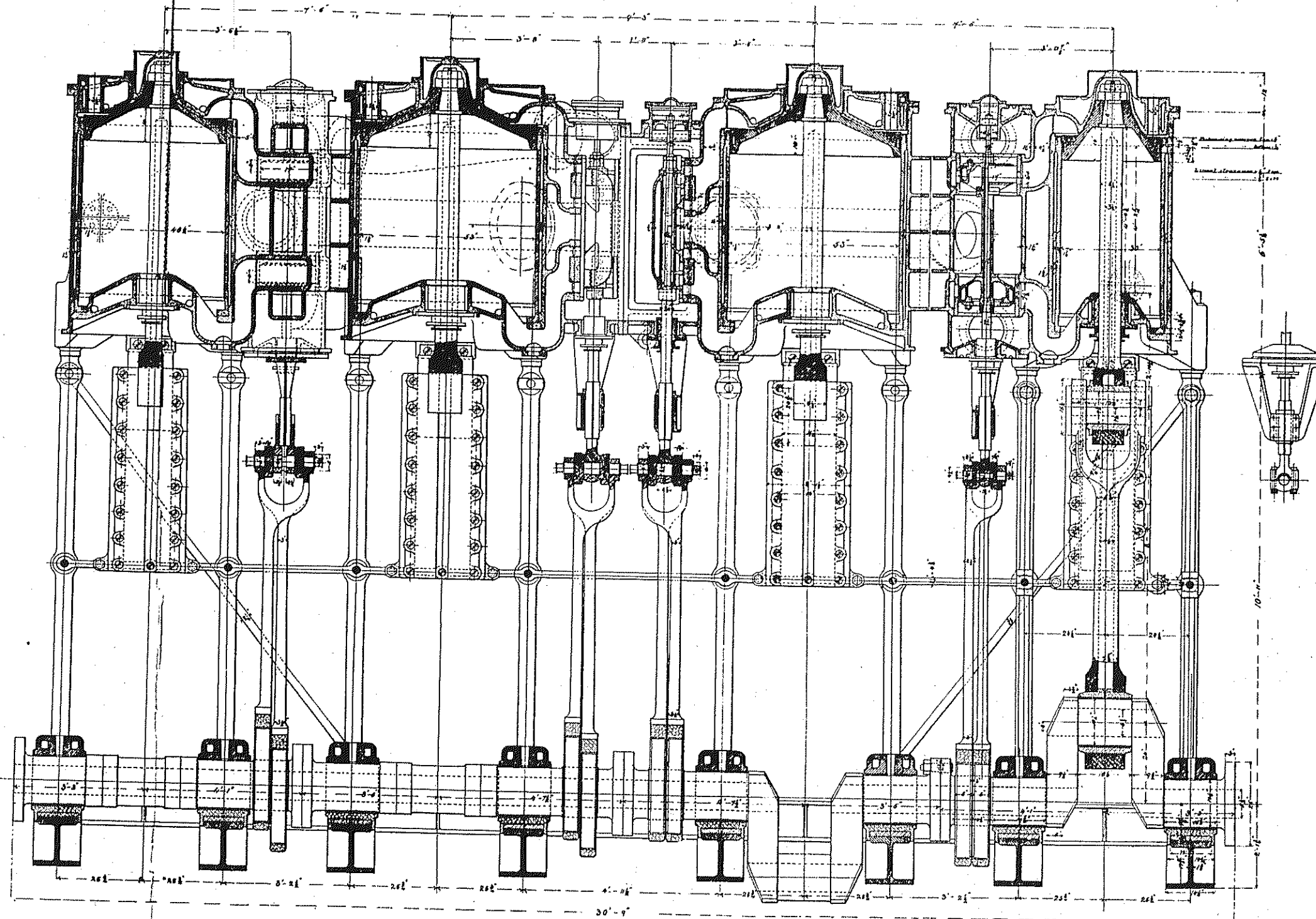
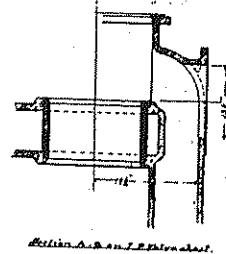
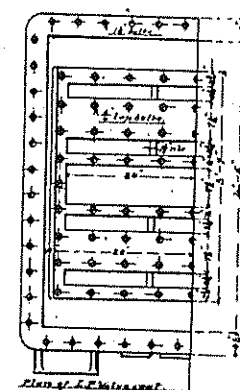
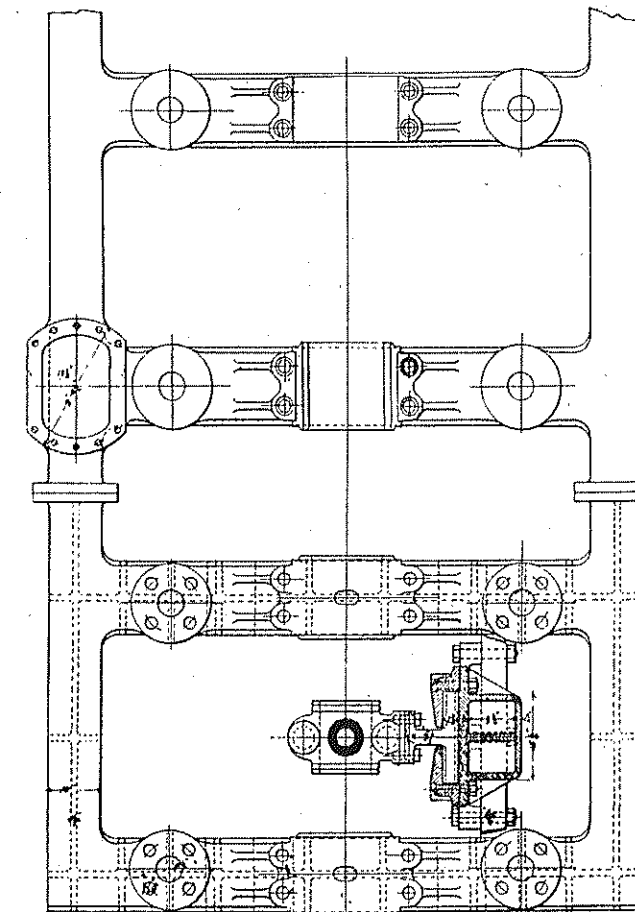
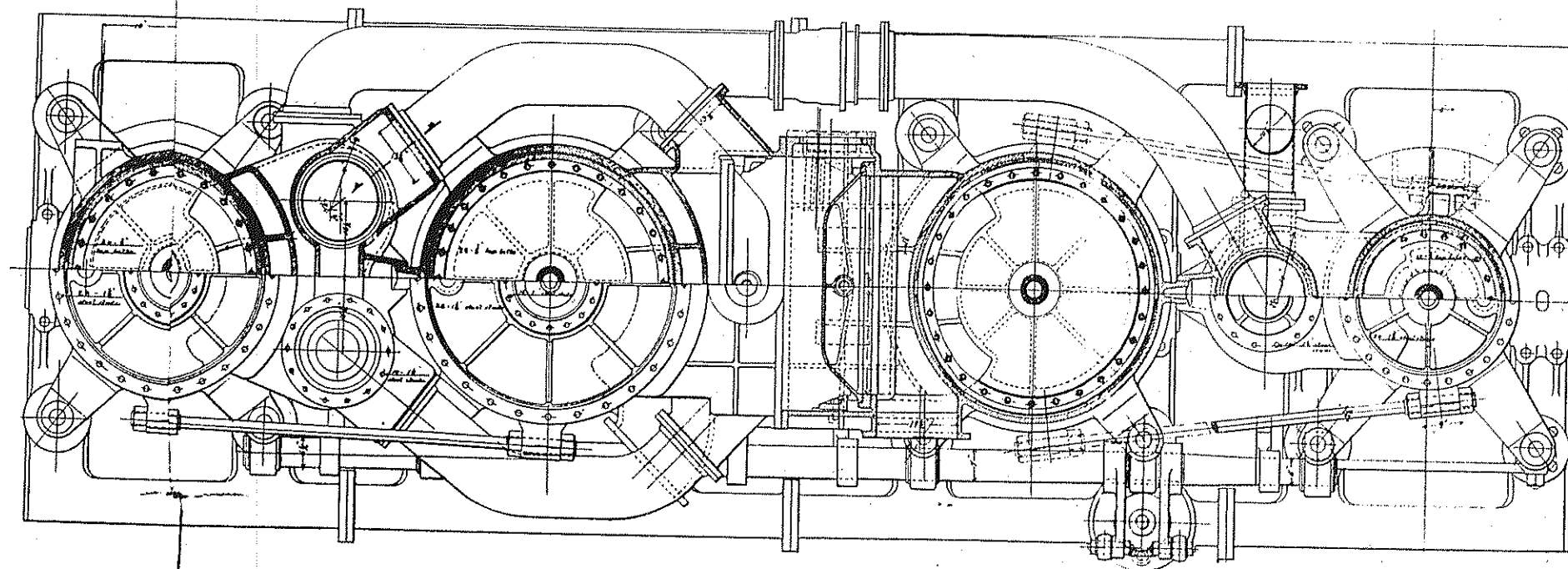
TORPEDO BOAT DESTROYERS
Nos 1 to 16
GENERAL ARRANGEMENT OF ENGINES.

Twin Screw — Two Engines.
 Displacement — 420 Tons.
 IHP. — 8000.
 Cylinders — 20; 32; 2-38.
 Stroke — 22.
 Revs. — 327.
 Scale — 1 in. = 1 ft.



DeMille
 ENGINEER-IN-CHIEF, U. S. N.
 CHIEF OF BUREAU OF STEAM ENGINEERING.



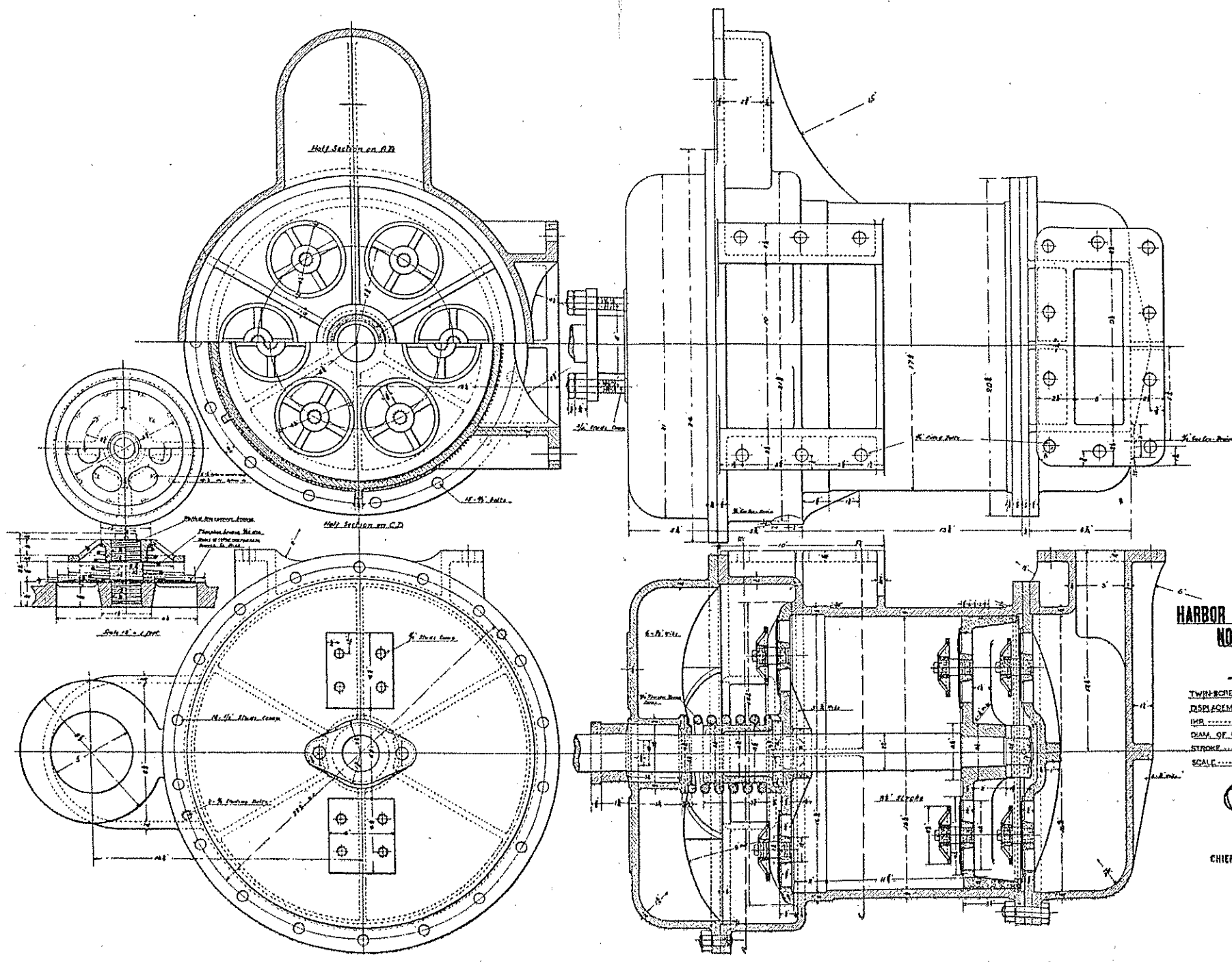


**BATTLE SHIPS NOS. 10, 11 & 12.
GENERAL ARRANGEMENT OF ENGINES.**

TWIN-SCREW	TWO ENGINES
DISPLACEMENT	11,500
IHP	10,000
DIAM. OF CYLINDERS	30", 46", 53", 53"
STROKE	48"
SCALE	1"=1'

Robb McMillan

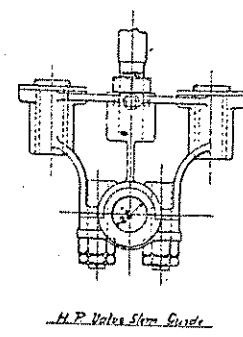
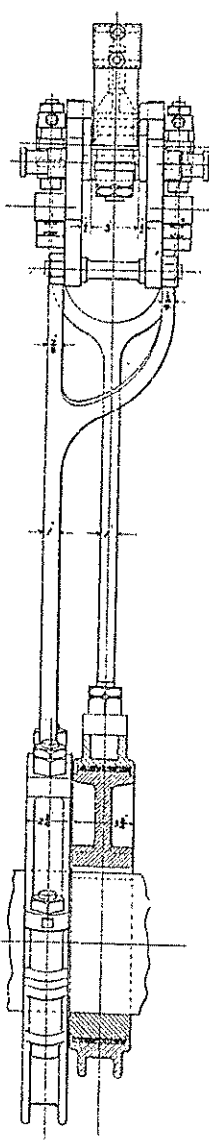
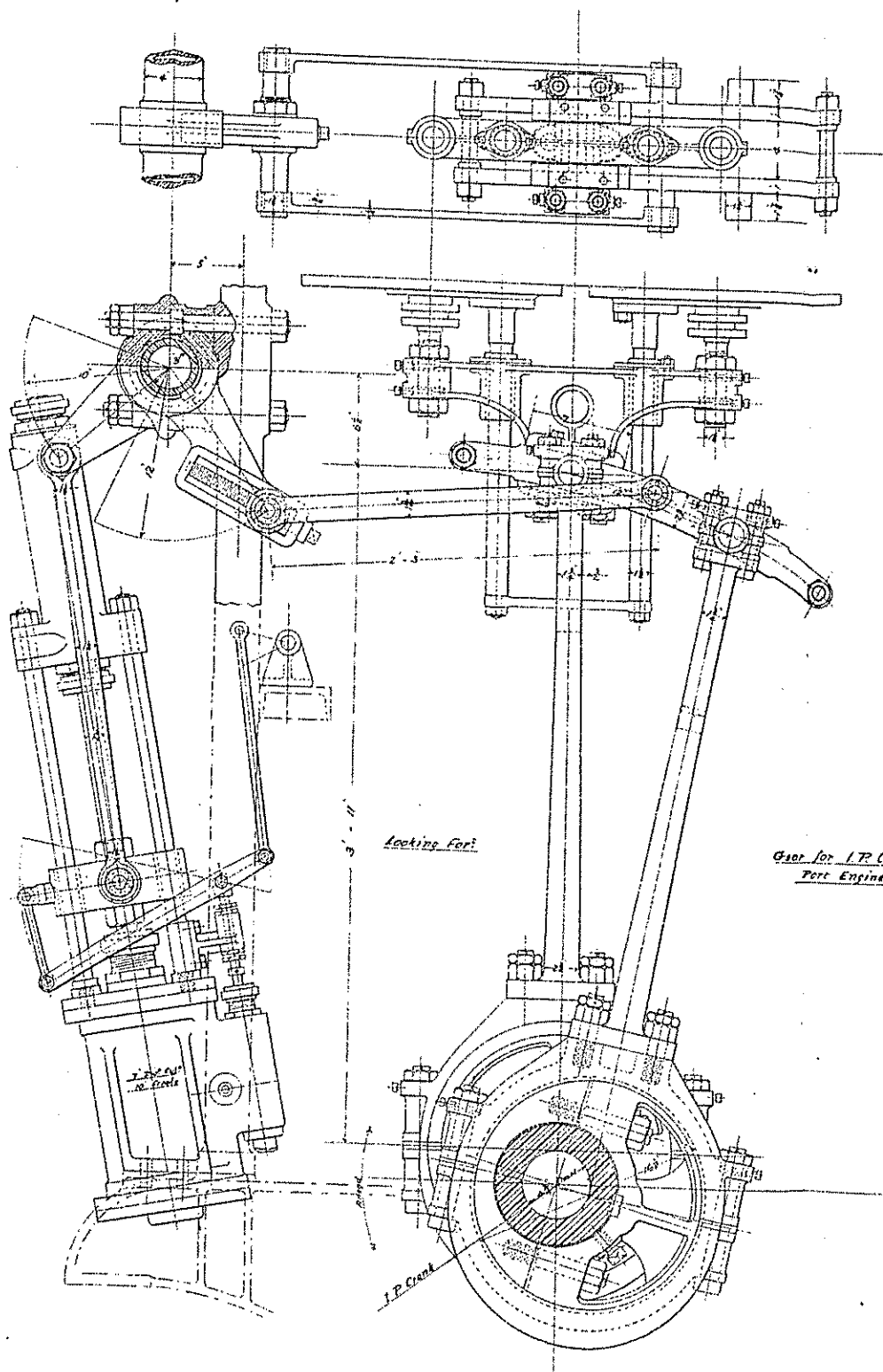
ENGINEER-IN-CHIEF, U. S. N.
CHIEF OF BUREAU OF STEAM ENGINEERING.



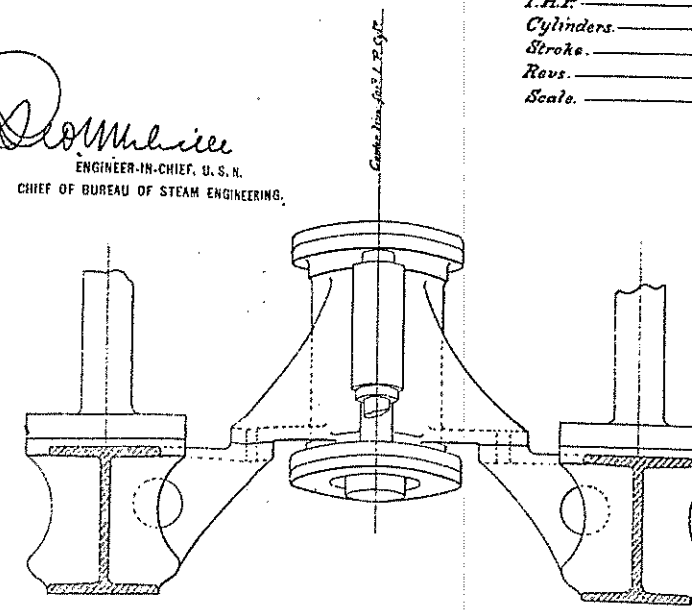
**HARBOR DEFENSE MONITORS,
NOS. 7, 8, 9 & 10,
AIR PUMP.**

TWIN-SCREW.....	TWO ENGINES
DISPLACEMENT.....	2700
R.P.M.....	2400
DIAM. OF CYLINDERS.....	17" 264.45"
STROKE.....	8.5"
SCALE.....	1/4" = 1'

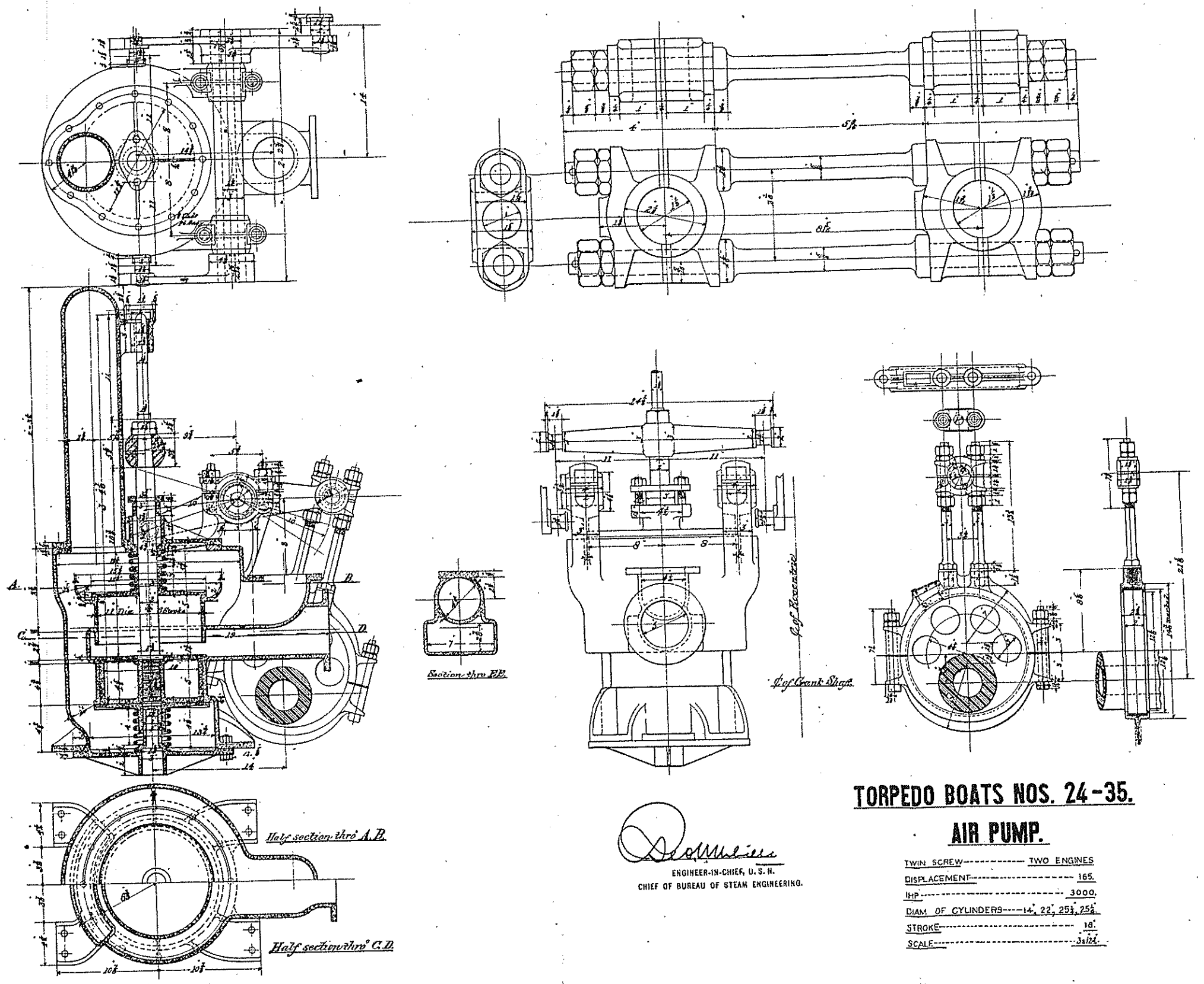
W. H. ...
ENGINEER-IN-CHIEF, U. S. N.
CHIEF OF BUREAU OF STEAM ENGINEERING.



D. M. White
 ENGINEER-IN-CHIEF, U. S. N.
 CHIEF OF BUREAU OF STEAM ENGINEERING.



TORPEDO BOAT
N^o 1
VALVE GEAR
 Twin Screw _____
 Displacement, _____
 I.H.P. _____
 Cylinders _____
 Stroke _____
 Revs. _____
 Scale _____

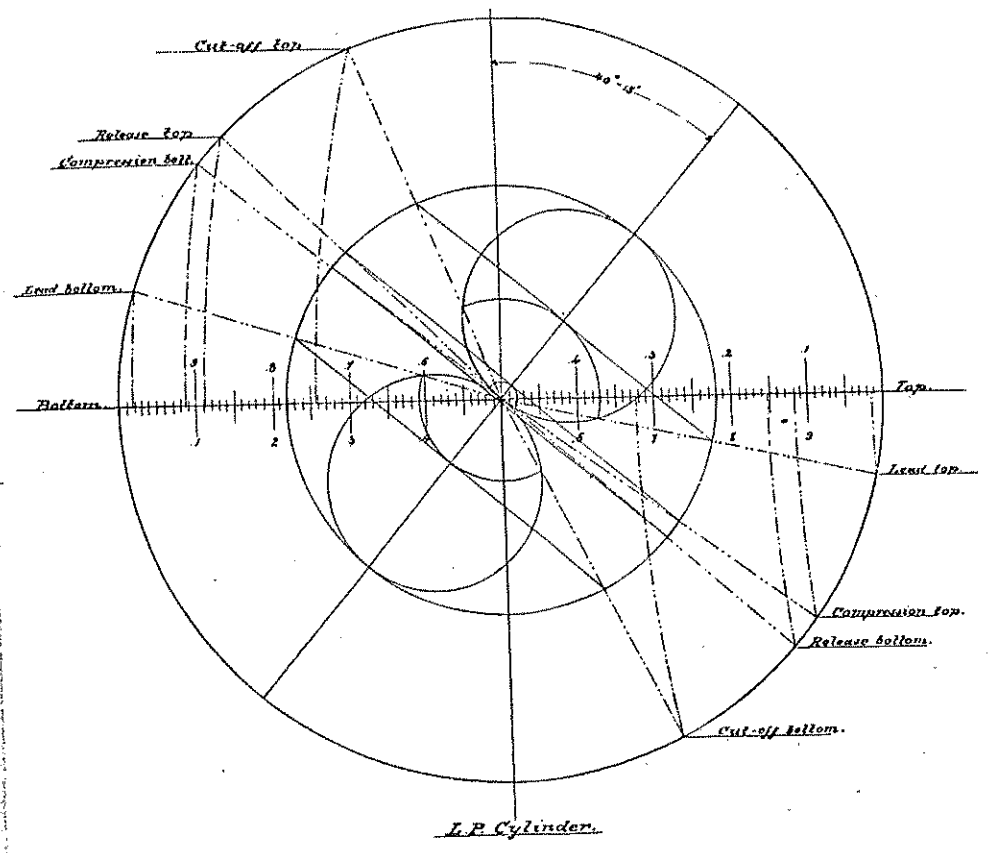
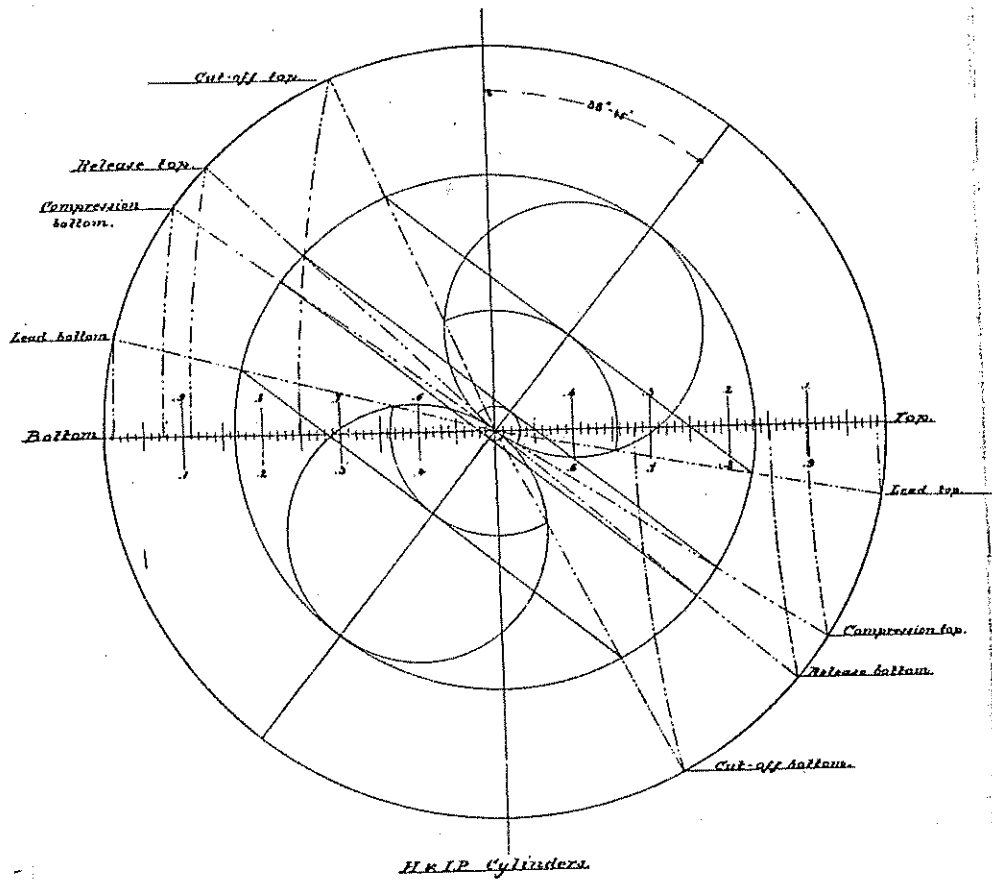


TORPEDO BOATS NOS. 24-35.

AIR PUMP.

TWIN SCREW	TWO ENGINES
DISPLACEMENT	165.
IHP	3000.
DIAM OF CYLINDERS	14, 22, 25, 25.
STROKE	18.
SCALE	3/8" = 1".

Samuel
 ENGINEER-IN-CHIEF, U. S. N.
 CHIEF OF BUREAU OF STEAM ENGINEERING.



**BATTLE SHIPS NOS. 10, 11 & 12.
VALVE DIAGRAMS.**

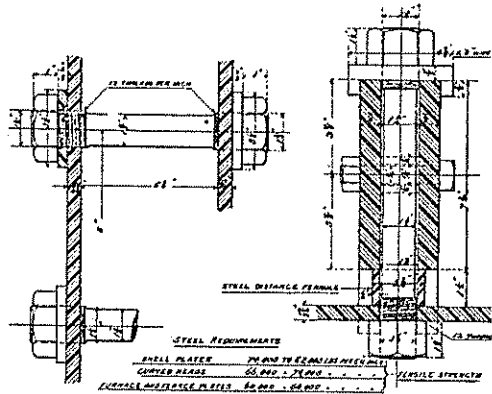
TWIN-SCREW ----- TWO ENGINES.
 DISPLACEMENT ----- 11,500.
 IHP ----- 10,000.
 DIAM. OF CYLINDERS 30", 46", 53", 53".
 STROKE ----- 48".
 SCALE ----- 3 & 12" = 1".

Deane
 ENGINEER-IN-CHIEF, U. S. N.
 CHIEF OF BUREAU OF STEAM ENGINEERING.

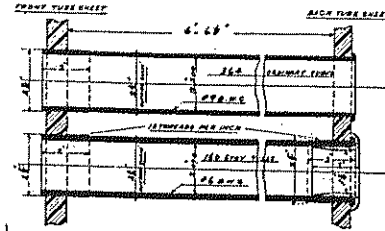
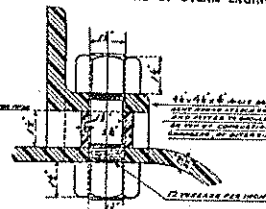
BATTLE-SHIPS NOS. 10.11.12.
BOILER.

TWIN-SCREW TWO ENGINES
 DISPLACEMENT 13,000
 IHP 30,467.53
 DIAM. OF CYLINDERS 50.467.53
 STROKE 48
 SCALE 1/4"

Robert Smith
 ENGINEER-IN-CHIEF, U.S.N.
 CHIEF OF BUREAU OF STEAM ENGINEERING.



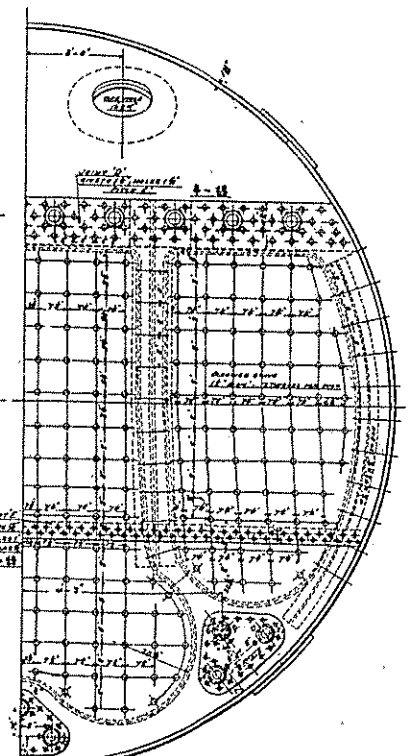
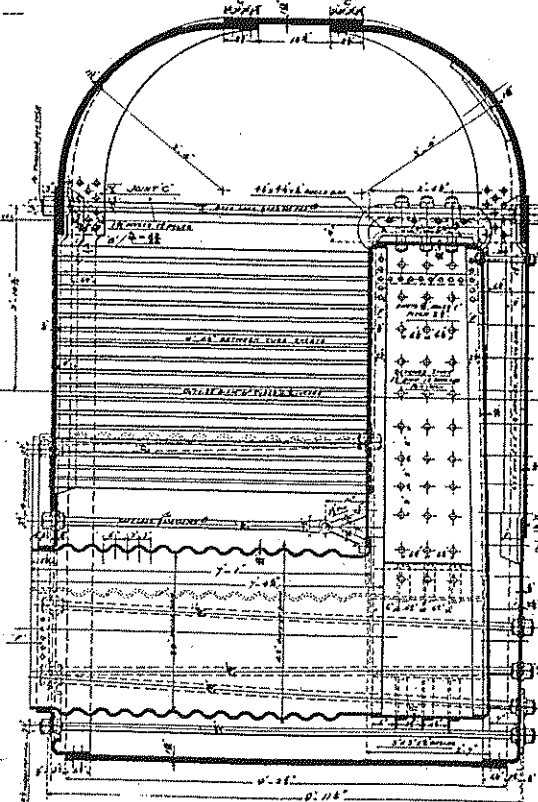
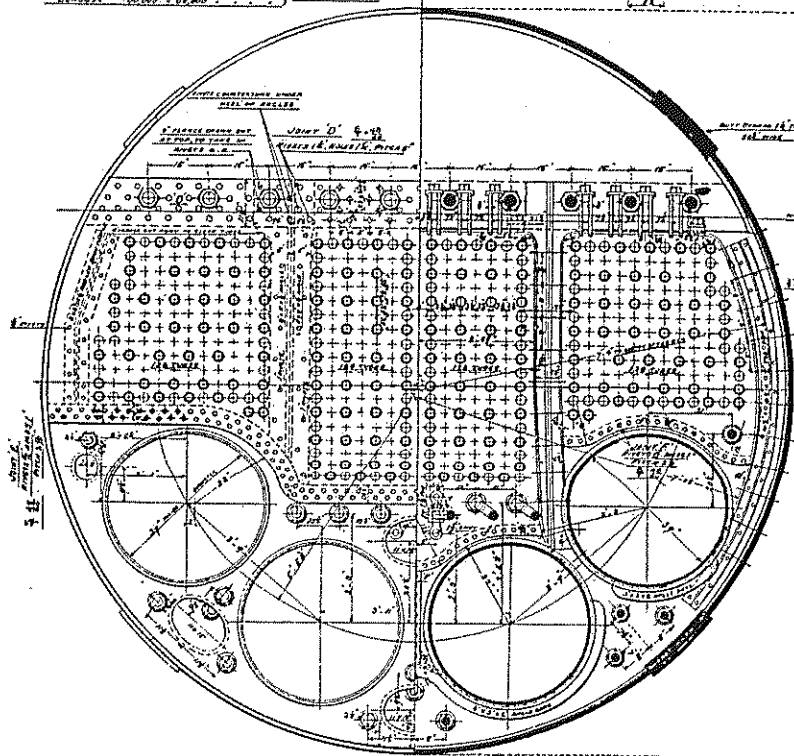
RIVETS
 HIGH GRADE 25,000 TO 35,000 LB. PRESSURE
 CLASS A 30,000 TO 35,000 LB.

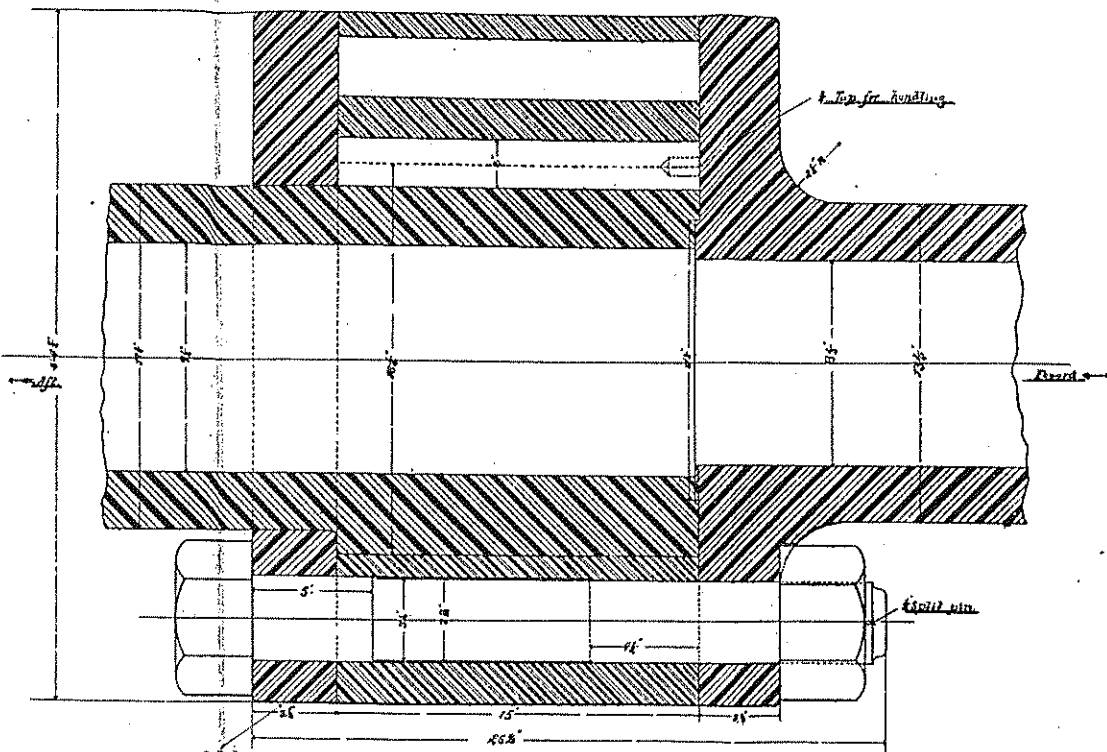
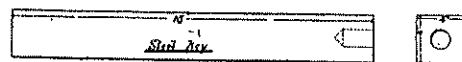
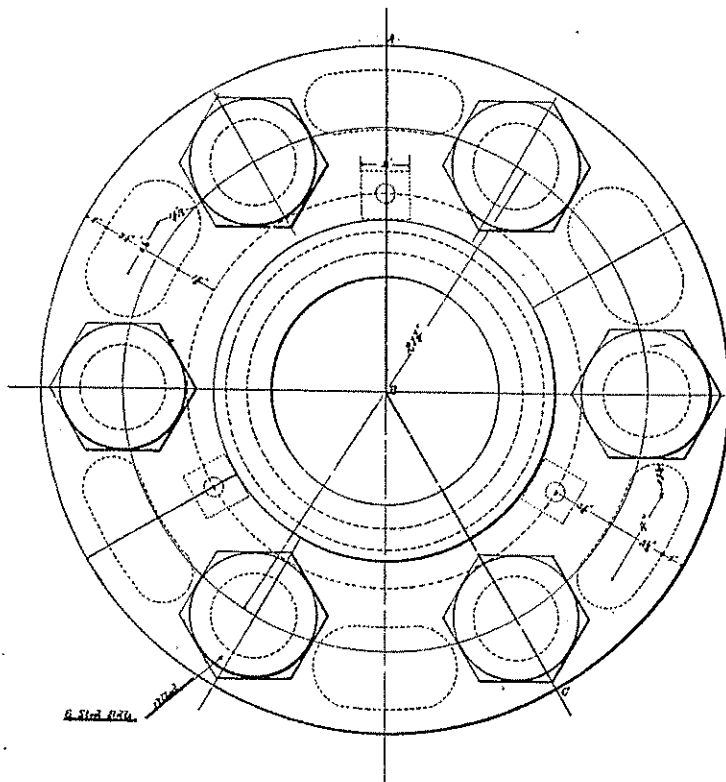


DIMENSIONS OF JOINTS		
DIAMETER	SPACE	DIAMETER
1/2"	1/8"	1/2"
3/4"	1/8"	3/4"
1"	1/8"	1"
1 1/4"	1/8"	1 1/4"
1 1/2"	1/8"	1 1/2"
1 3/4"	1/8"	1 3/4"
2"	1/8"	2"
2 1/4"	1/8"	2 1/4"
2 1/2"	1/8"	2 1/2"
2 3/4"	1/8"	2 3/4"
3"	1/8"	3"
3 1/4"	1/8"	3 1/4"
3 1/2"	1/8"	3 1/2"
3 3/4"	1/8"	3 3/4"
4"	1/8"	4"

DATA	10.11.12.	11.11.12.	12.11.12.
DIAMETER OF CYLINDER	50.467	50.467	50.467
LENGTH OF CYLINDER	100.000	100.000	100.000
DIAMETER OF TUBES	10.000	10.000	10.000
LENGTH OF TUBES	100.000	100.000	100.000
DIAMETER OF JOINTS	10.000	10.000	10.000
LENGTH OF JOINTS	100.000	100.000	100.000
DIAMETER OF HEADS	50.467	50.467	50.467
LENGTH OF HEADS	10.000	10.000	10.000
DIAMETER OF FEET	50.467	50.467	50.467
LENGTH OF FEET	10.000	10.000	10.000
DIAMETER OF DRUMS	50.467	50.467	50.467
LENGTH OF DRUMS	10.000	10.000	10.000
DIAMETER OF CONDUITS	50.467	50.467	50.467
LENGTH OF CONDUITS	10.000	10.000	10.000
DIAMETER OF VALVES	50.467	50.467	50.467
LENGTH OF VALVES	10.000	10.000	10.000
DIAMETER OF FITTINGS	50.467	50.467	50.467
LENGTH OF FITTINGS	10.000	10.000	10.000
DIAMETER OF BOLTS	50.467	50.467	50.467
LENGTH OF BOLTS	10.000	10.000	10.000
DIAMETER OF NUTS	50.467	50.467	50.467
LENGTH OF NUTS	10.000	10.000	10.000
DIAMETER OF WASHERS	50.467	50.467	50.467
LENGTH OF WASHERS	10.000	10.000	10.000
DIAMETER OF RIVETS	50.467	50.467	50.467
LENGTH OF RIVETS	10.000	10.000	10.000

ESTIMATED WEIGHT OF BOILER 41,000 LBS. FROM 100,000 LBS.



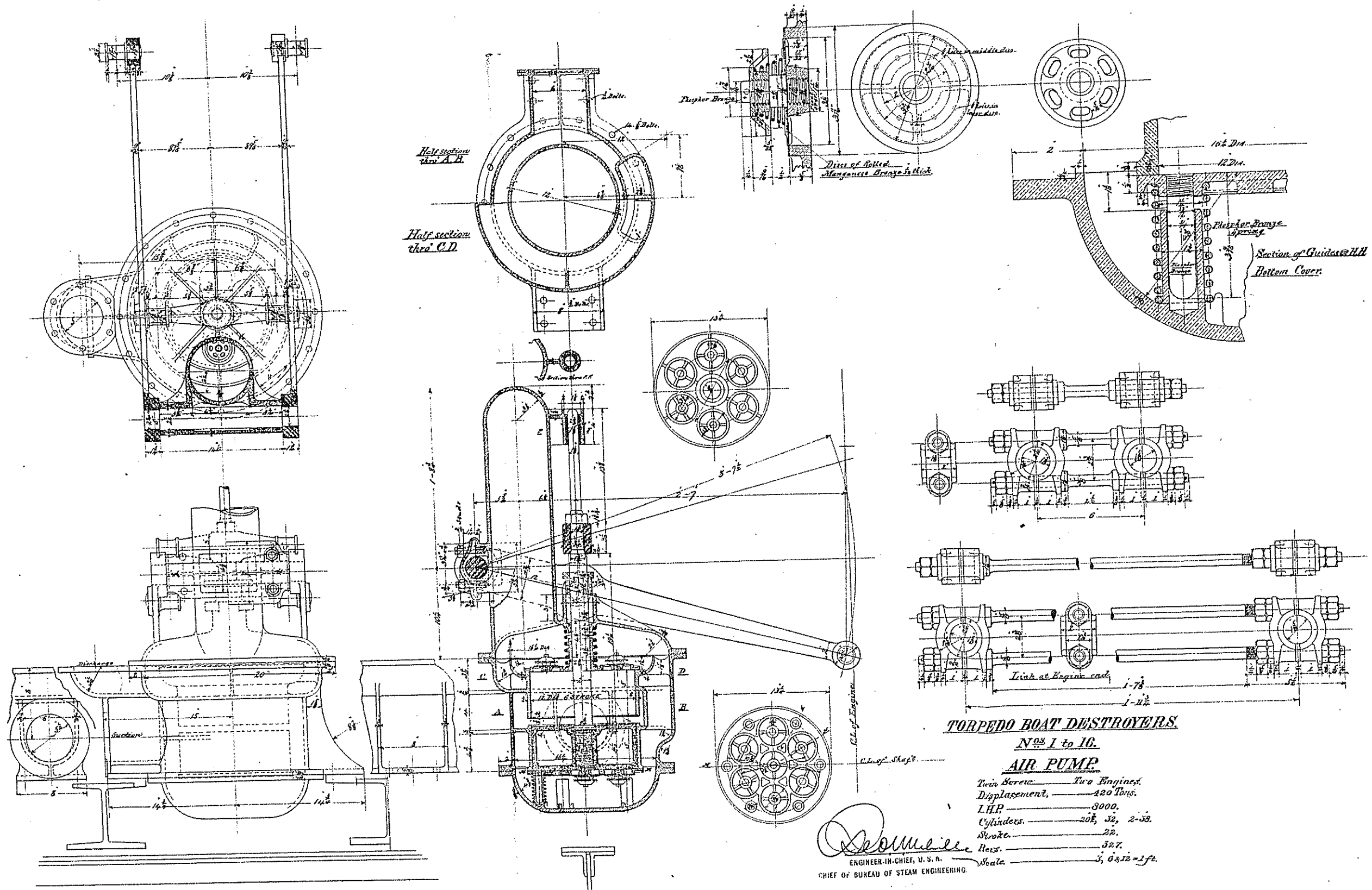


Section on A.B.C.

**BATTLE SHIPS NOS. 10, 11 & 12.
PROPELLER SHAFT COUPLING.**

Donnell
ENGINEER-IN-CHIEF, U. S. N.
CHIEF OF BUREAU OF STEAM ENGINEERING.

TWIN-SCREW	-----	TWO-SCREW
DISPLACEMENT	-----	11,500
H.P.	-----	10,000
DIAM. OF CYLINDERS	-----	30" x 66" x 72" x 53"
SHAFT	-----	10"
SCALE	-----	6"-1"




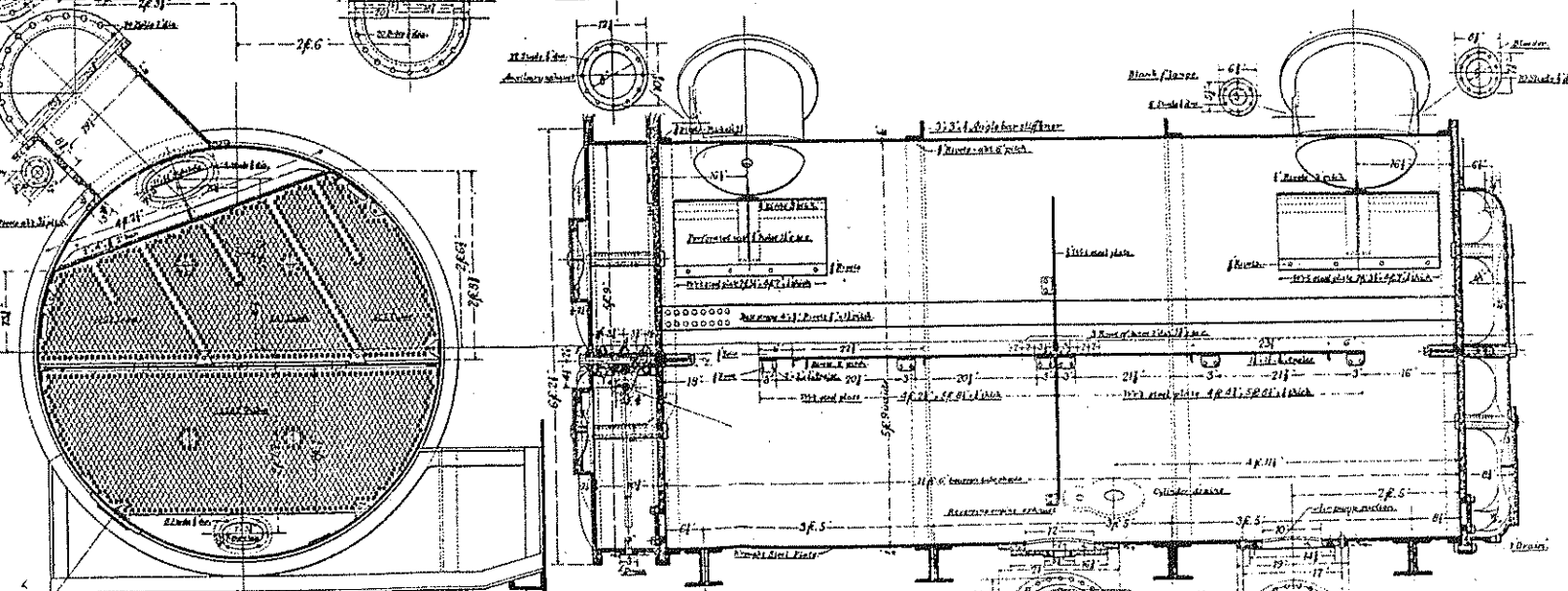
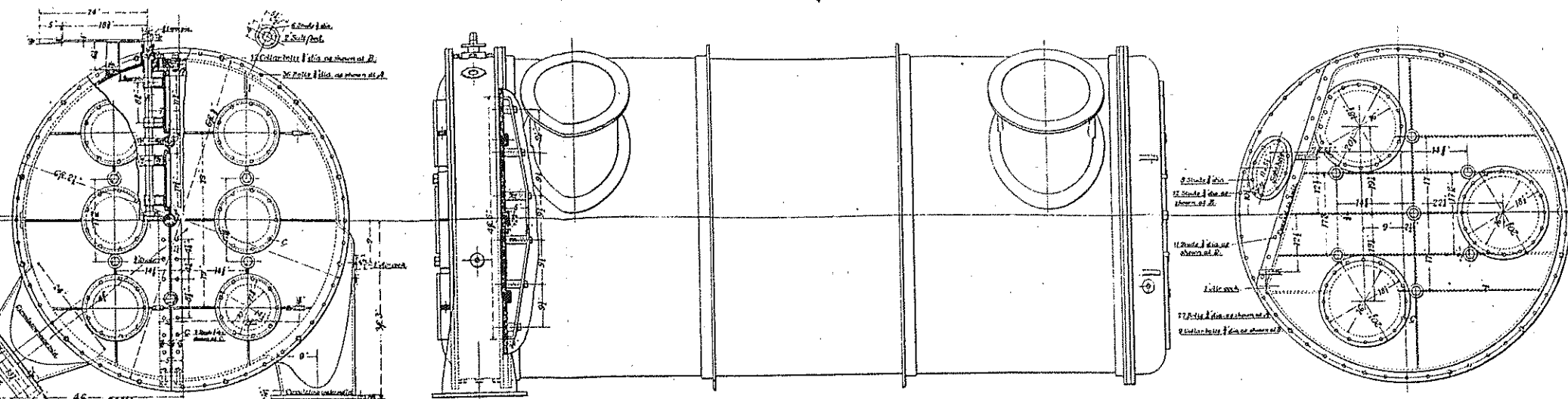
TORPEDO BOAT DESTROYERS.

N^{os} 1 to 10.

AIR PUMP.

Twin Screw	Two Engines.
Displacement	420 Tons.
I.H.P.	8000.
Cylinders	20 $\frac{1}{2}$, 32, 2-33.
Stroke	22.
Revs.	327.
Scale	$\frac{1}{8}$, 0.8, 12 = 2 ft.


 ENGINEER-IN-CHIEF, U. S. N.
 CHIEF OF BUREAU OF STEAM ENGINEERING

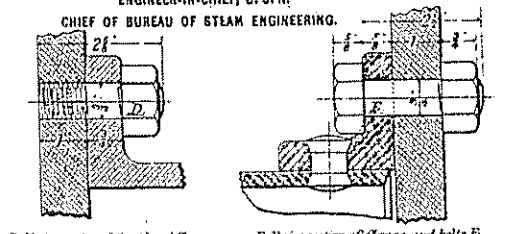


**BATTLE SHIPS NOS. 10, 11 & 12.
CONDENSER.**

TWIN SCREW TWO ENGINES
 DISPLACEMENT 11,000
 IHP 10,000
 DIAM. OF CYLINDERS - 30", 46", 53", 53"
 STROKE 45"
 SCALE 1/4"=1'

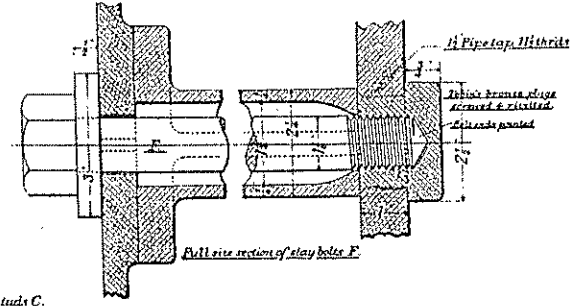
Joseph M. ...
 ENGINEER-IN-CHIEF, U. S. N.

CHIEF OF BUREAU OF STEAM ENGINEERING.

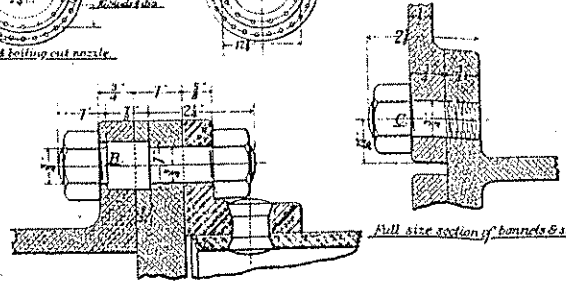


Full size section of flange and studs D.

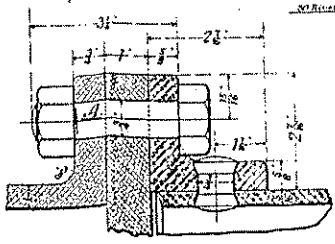
Full size section of flange and bolts E.



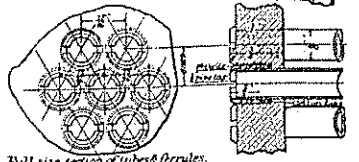
Full size section of stay bolts F.



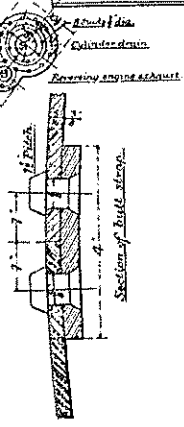
Full size section of flange and collar bolts B.



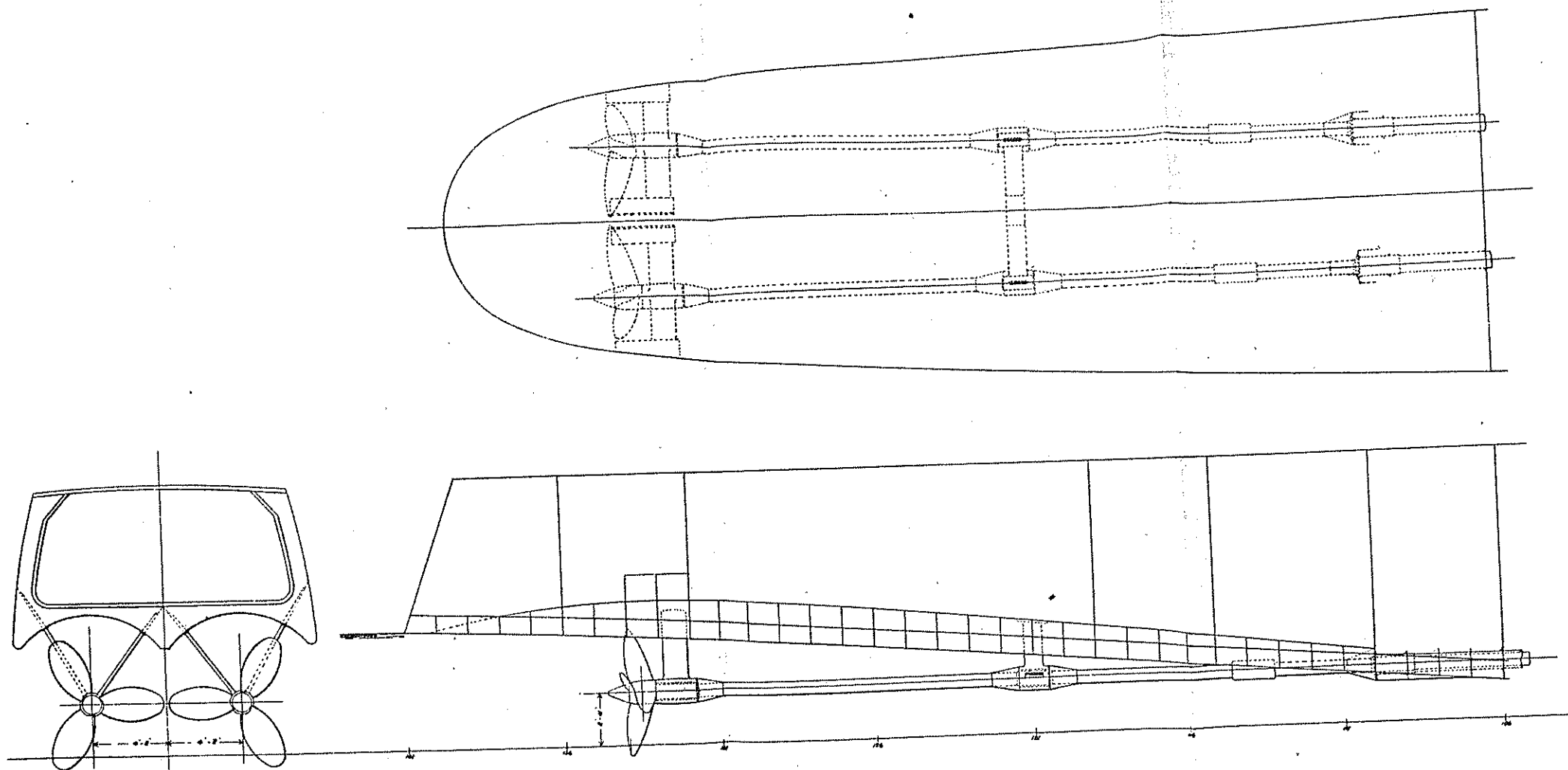
Full size section of flange and bolts A.



Full size section of tubes & ferrules.
 35% Seamless drawn 316 stainless steel tubes, lined inside and out.
 Outside diam. N° 19 B. W.G. Length over all 11 ft. 6 in.
 Cooling surface 6750 sq. ft.
 All bolts, studs and stays to be of T. B. bronze.



Section of boiler strap.



TORPEDO BOAT DESTROYERS.
Nos 1 to 16
ARRANGEMENT OF STERN-TUBE
& PROPELLER SHAFTING

Twin Screw — Two Engines
 Displacement, — 420 Tons
 I.H.P. — 8000
 Cylinders — 20 $\frac{1}{2}$, 32, 2-38
 Stroke. — 22
 Revs. — 327
 Scale — $\frac{1}{8}$ " = 1 foot

W. M. Wheeler

ENGINEER-IN-CHIEF, U. S. N.
 CHIEF OF BUREAU OF STEAM ENGINEERING.

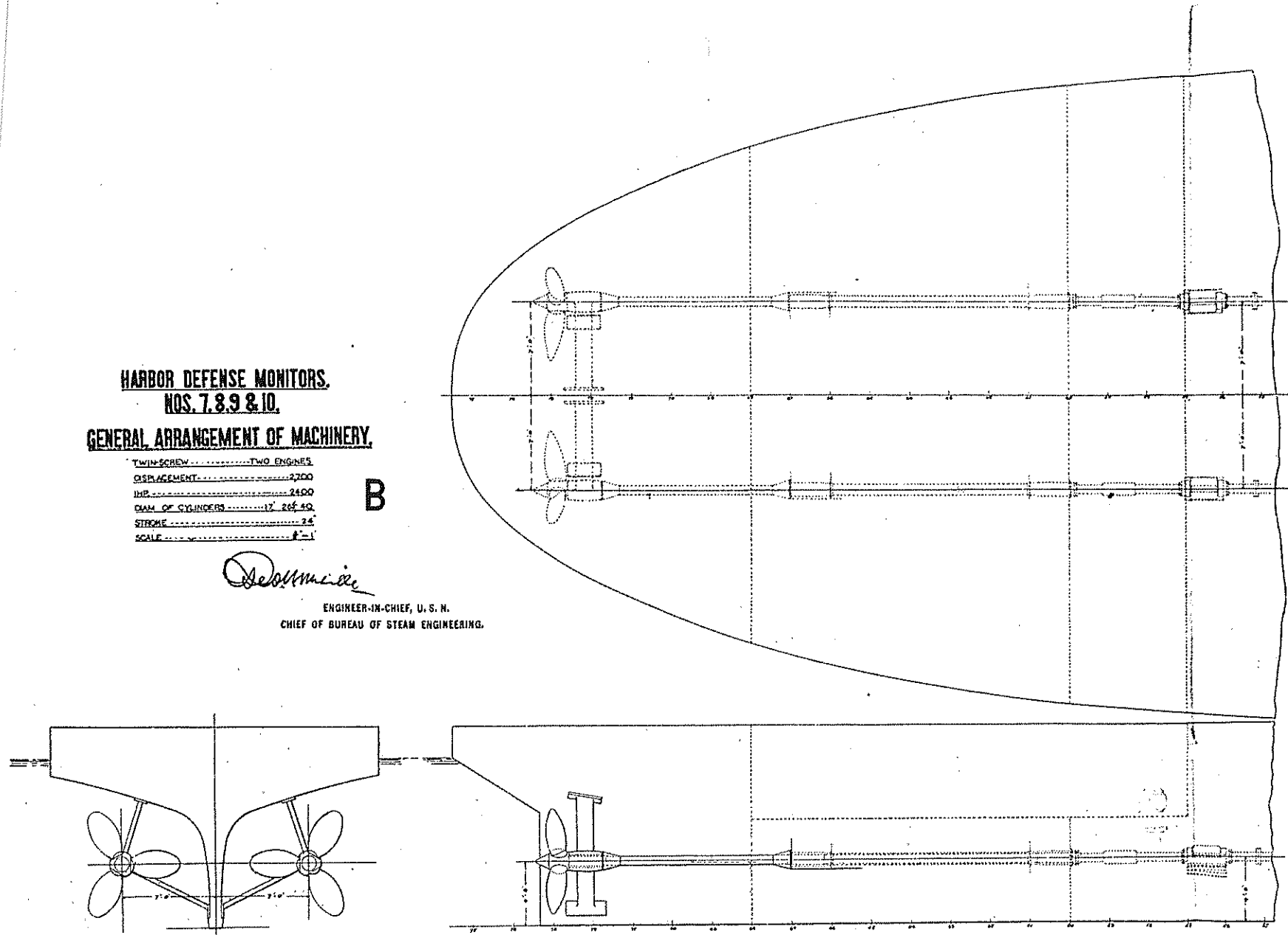
**HARBOR DEFENSE MONITORS,
NOS. 7, 8, 9 & 10.
GENERAL ARRANGEMENT OF MACHINERY.**

TWIN-SCREW TWO ENGINES
DISPLACEMENT 2700
HP 2400
DIAM. OF CYLINDERS 17 2/3"
STROKE 24"
SCALE 1"=1'

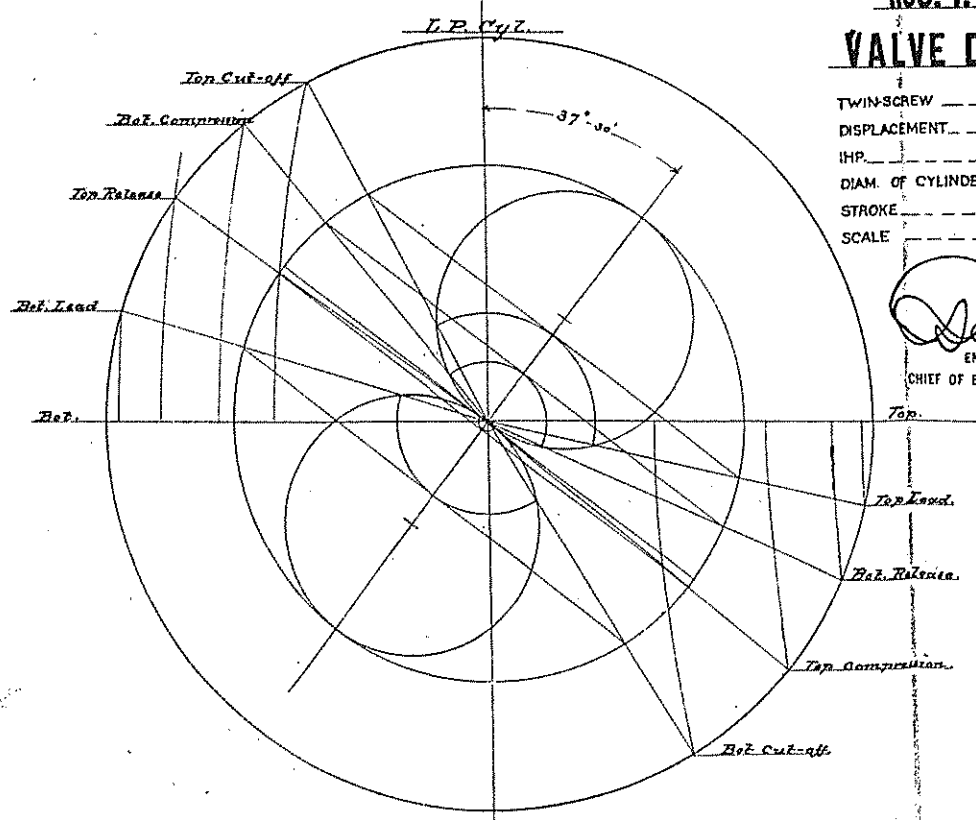
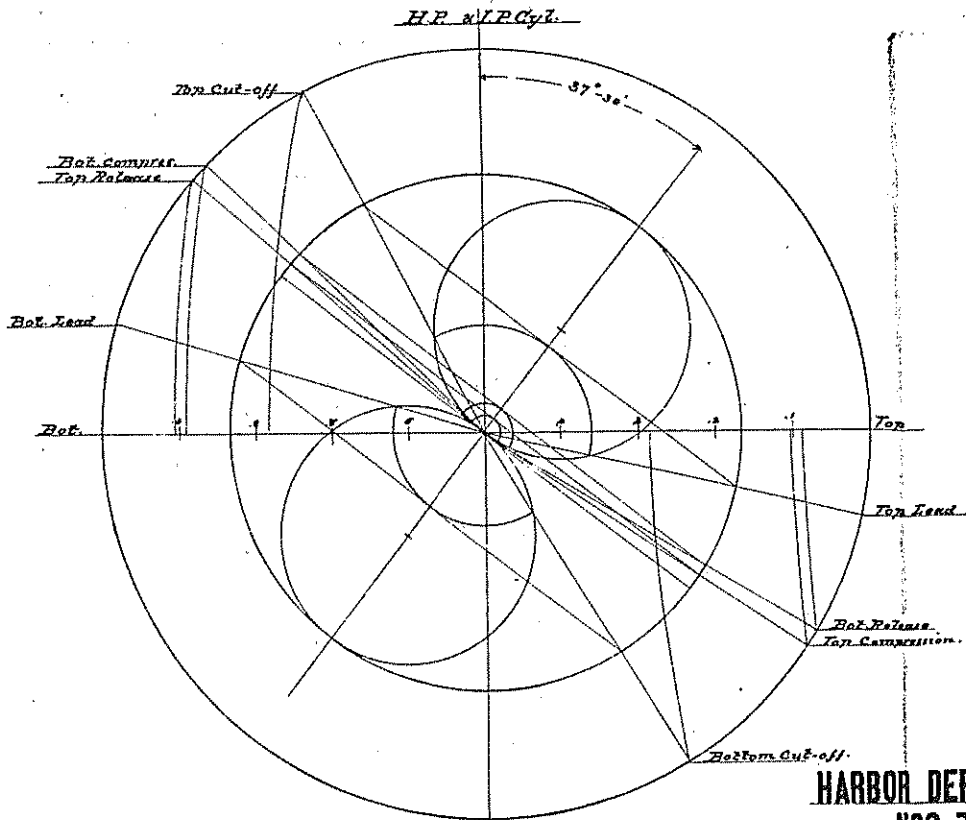
B

DeWitt

ENGINEER-IN-CHIEF, U. S. N.
CHIEF OF BUREAU OF STEAM ENGINEERING.



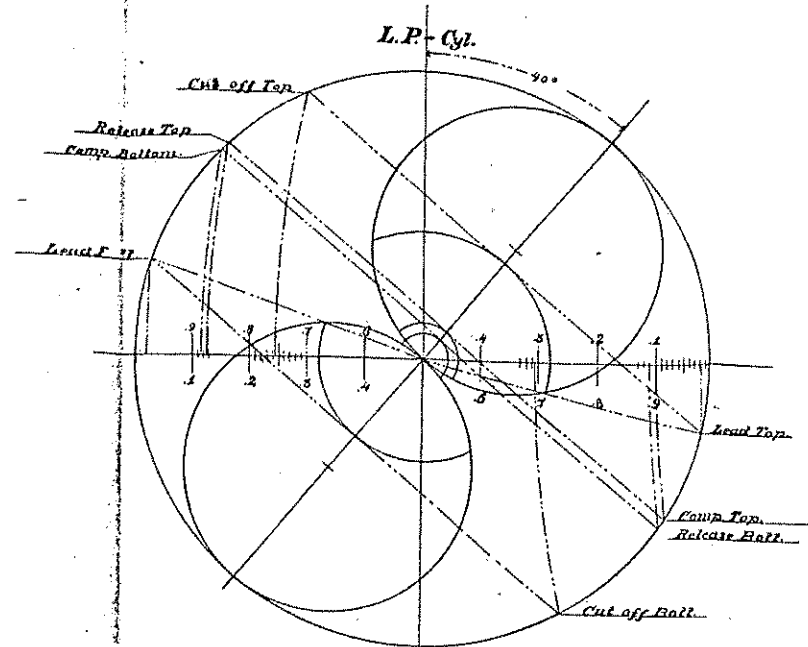
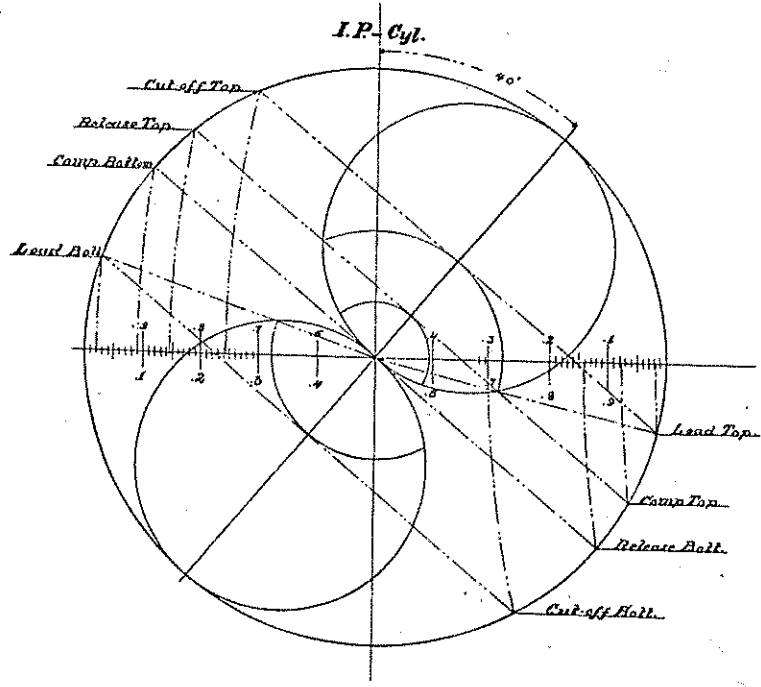
13



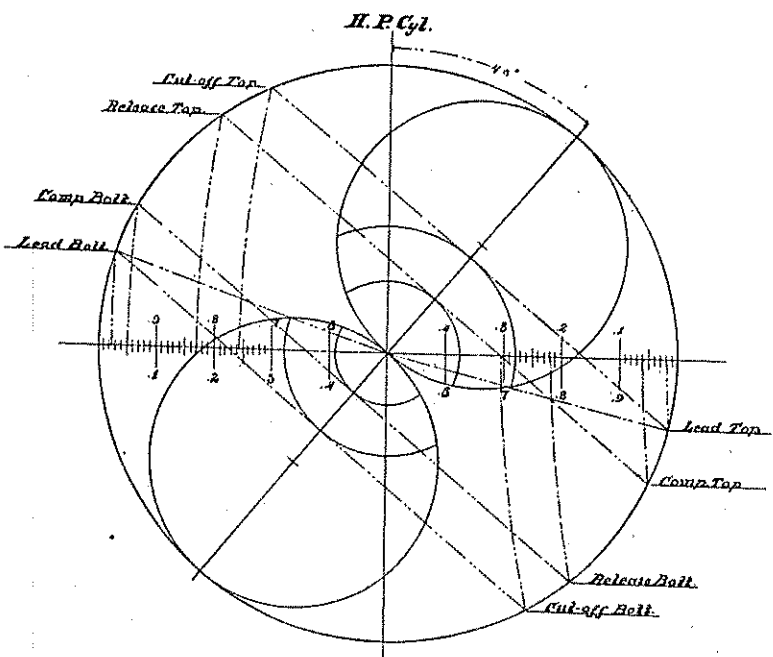
**HARBOR DEFENSE MONITORS.
NOS. 7. 8. 9 & 10.
VALVE DIAGRAMS.**

TWIN-SCREW	.....	TWO ENGINES
DISPLACEMENT	.....	2,700
IHP	.....	2400
DIAM. OF CYLINDERS	.....	17, 26 1/2, 40"
STROKE	.....	24"
SCALE	.....	8" = 24" = 1'

DeWitt
ENGINEER-IN-CHIEF, U. S. N.
CHIEF OF BUREAU OF STEAM ENGINEERING.



VALVE DIAGRAMS.

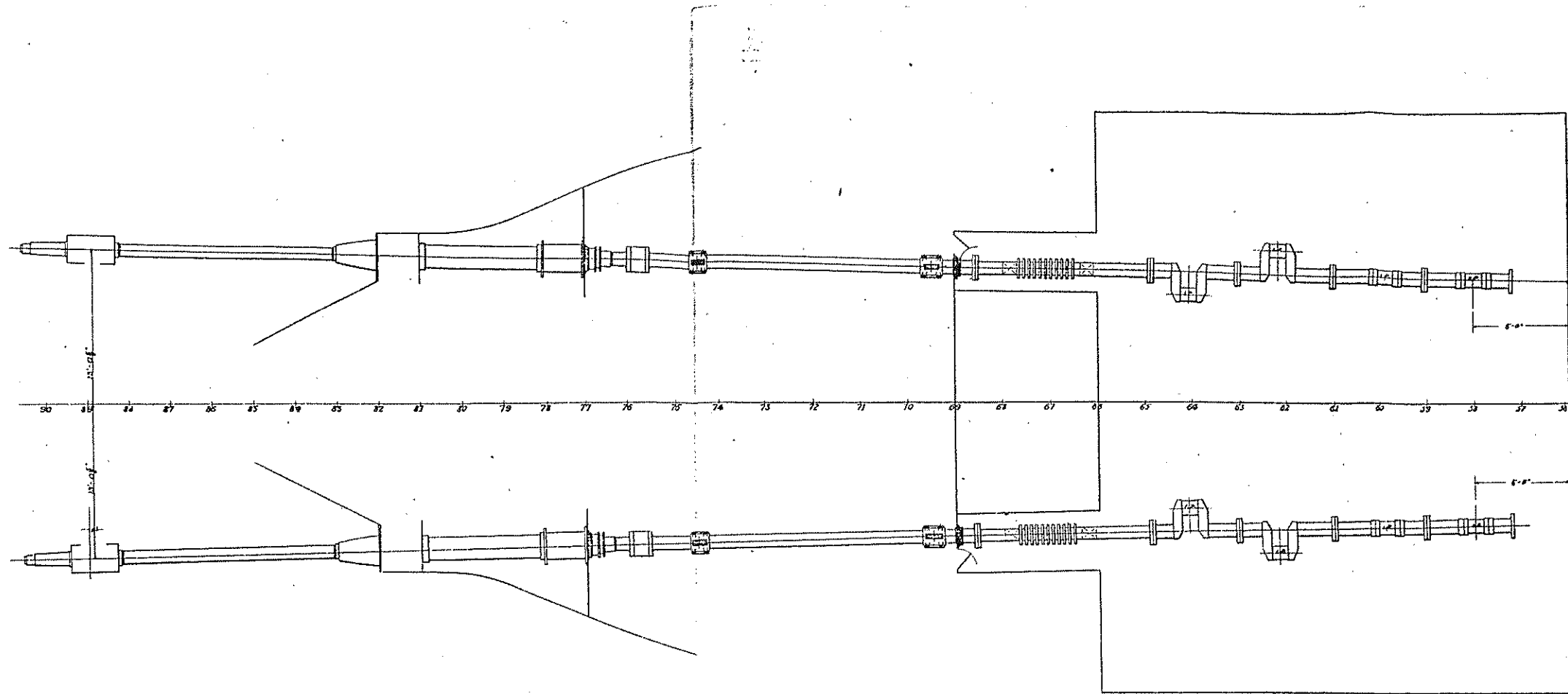


Make of Vessel	Torpedo Boat Nos. 24 to 35.		
Year, Month & Day	1889 I.H.P. April 185 tons.		
Type & number of Eng.	Triple-Stroke Triple Exp. Direct Acting vert.		
Dimensions and stroke	14" x 22" x 22" 14" Stroke.		
Valve Gear	Stephenson Link motion		
Connecting Rod	40"		
Scale of Crank Circle & Size	Scale of Valve Circles Double Size.		
	H. P.	I. P.	L. P.
Lead	2 1/2"	2 1/2"	2 1/2"
Lead of Valve	1 1/2"	1 1/2"	1 1/2"
Lead & number of valves and size of valve	one 7 1/2"	one 1 1/2"	one 1 1/2"
Size of valve in inch diameter	one 7 1/2"	one 1 1/2"	one 1 1/2"
Kind of port & length of valve	Top Bottom	Top Bottom	Top Bottom
Steam Exp.	1 1/2" 1 1/2"	1 1/2" 1 1/2"	1 1/2" 1 1/2"
Release Exp.	1 1/2" 1 1/2"	1 1/2" 1 1/2"	1 1/2" 1 1/2"
Angular Advance	90°	90°	90°
Steam Exp. Angular	1 1/2" 1 1/2"	1 1/2" 1 1/2"	1 1/2" 1 1/2"
Linear	1 1/2" 1 1/2"	1 1/2" 1 1/2"	1 1/2" 1 1/2"
Cut-off in inches	12.50 12.50	12.50 12.50	12.50 12.50
Cut-off in inches of stroke	7.50 7.50	6.75 6.75	6.75 6.75
Exp. Release in inches	14.50 14.50	13.25 13.25	13.25 13.25
" " " diameter of stroke	83 83	86 86	87 87
Compression in inch	1.08 1.08	1.08 1.08	1.08 1.08
Compression in inch of stroke	0.6 0.6	0.75 0.75	0.75 0.75
Steam opening	1 1/2" 1 1/2"	1 1/2" 1 1/2"	1 1/2" 1 1/2"
Exp.	Full Full	Full Full	Full Full
Velocity of Steam in ft. per min.	141.19	140.7	140.0
Velocity of Exp. in ft. per min.	91.06	114.7	130.8
Position of piston to be given in per stroke	REMARKS.		
Checked by	Date		

U.S. TORPEDO BOATS NOS. 24 TO 35.
VALVE DIAGRAMS.
FOR
H.P. I.P. AND L.P. ENGINES.
Scale of Valve circle 2:1.

[Signature]

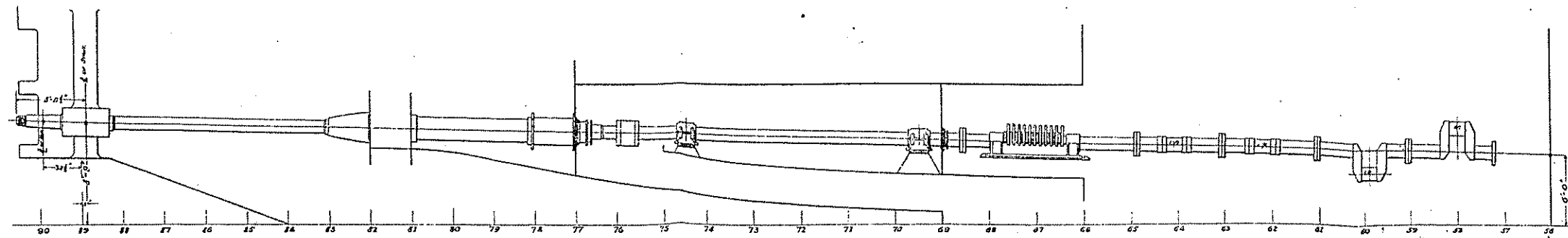
ENGINEER-IN-CHIEF, U. S. N.
CHIEF OF BUREAU OF STEAM ENGINEERING.



**BATTLE SHIPS NOS. 10, 11 & 12.
GENERAL ARRANGEMENT OF MACHINERY.**

TWIN SCREW.....TWO ENGINES.
 DISPLACEMENT.....11,500
 IHP.....10,000
 DIAM. OF CYLINDERS.....30.4615353'
 STROKE.....48'
 SCALE.....1"=1'

C



W. M. Miller

ENGINEER-IN-CHIEF, U. S. N.
CHIEF OF BUREAU OF STEAM ENGINEERING.