

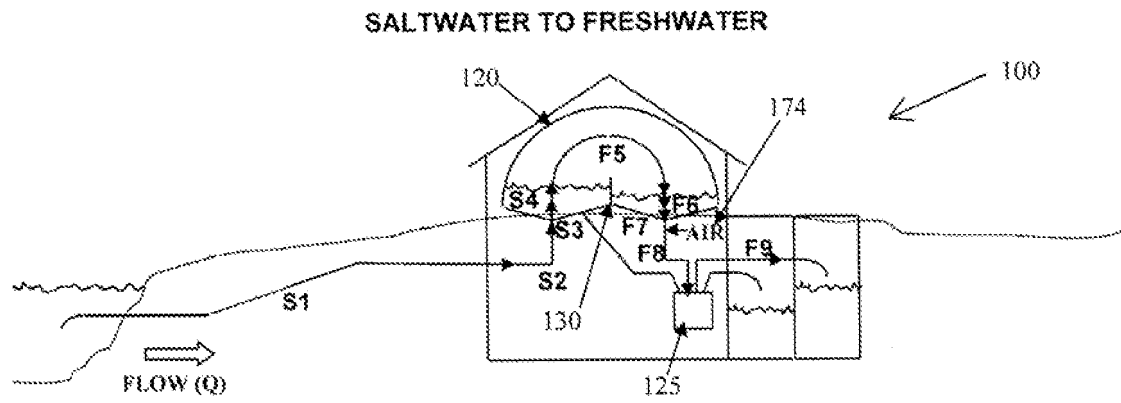


FIG. 1A

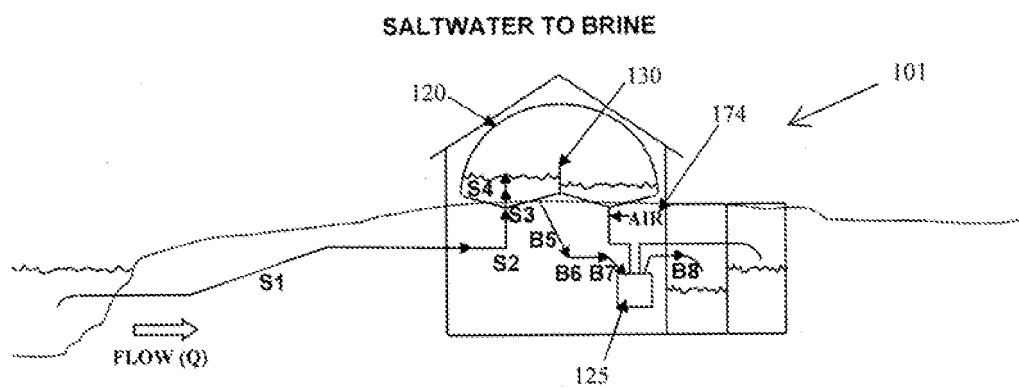


FIG. 1B

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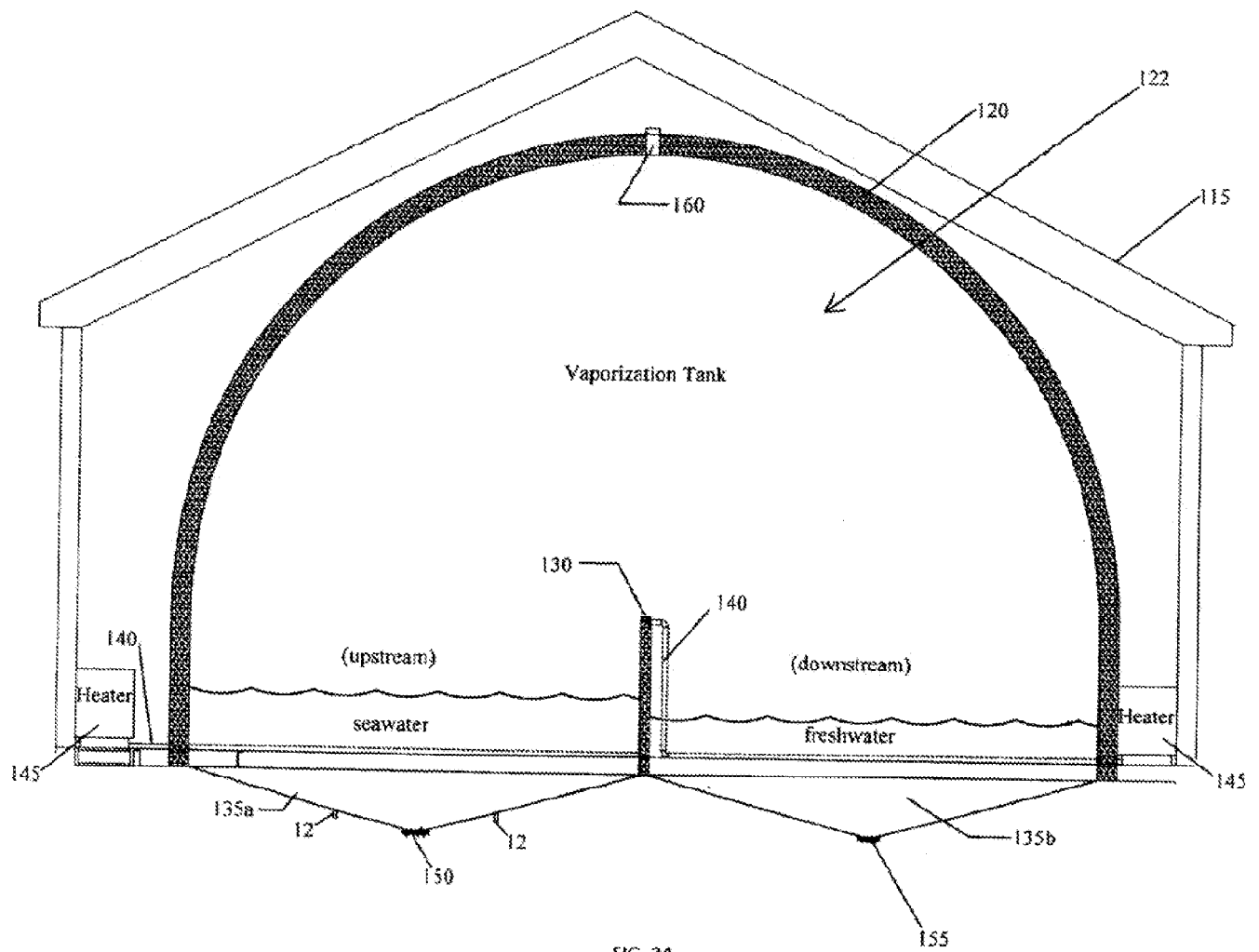
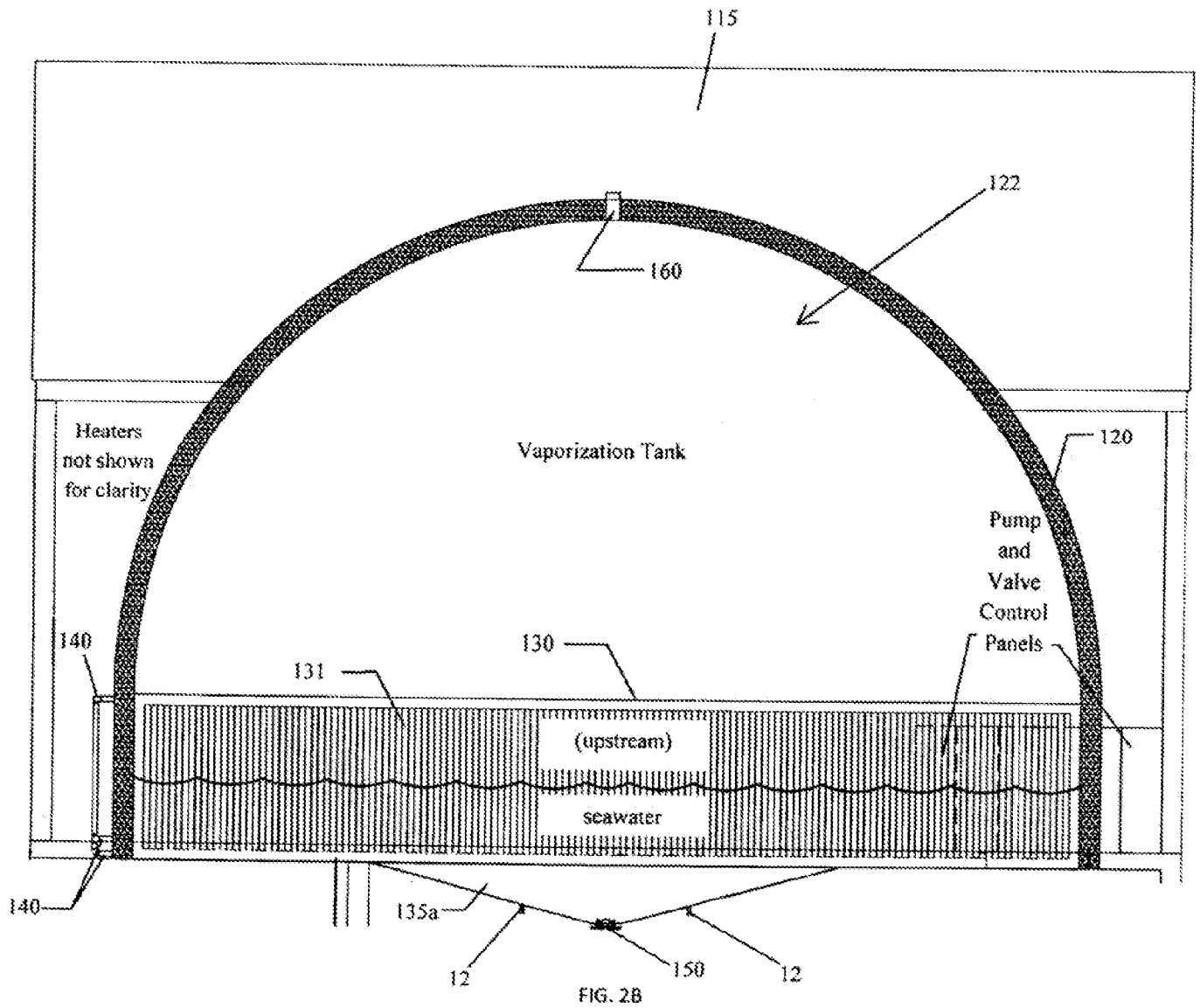


FIG. 2A

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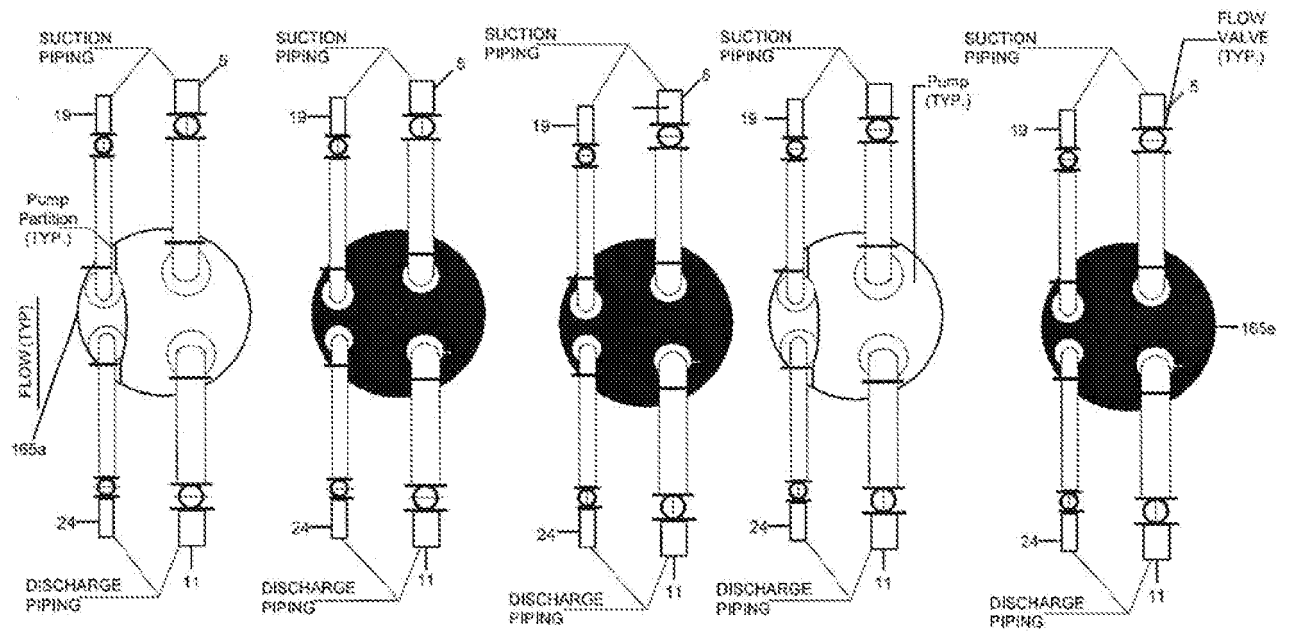


FIG. 3A

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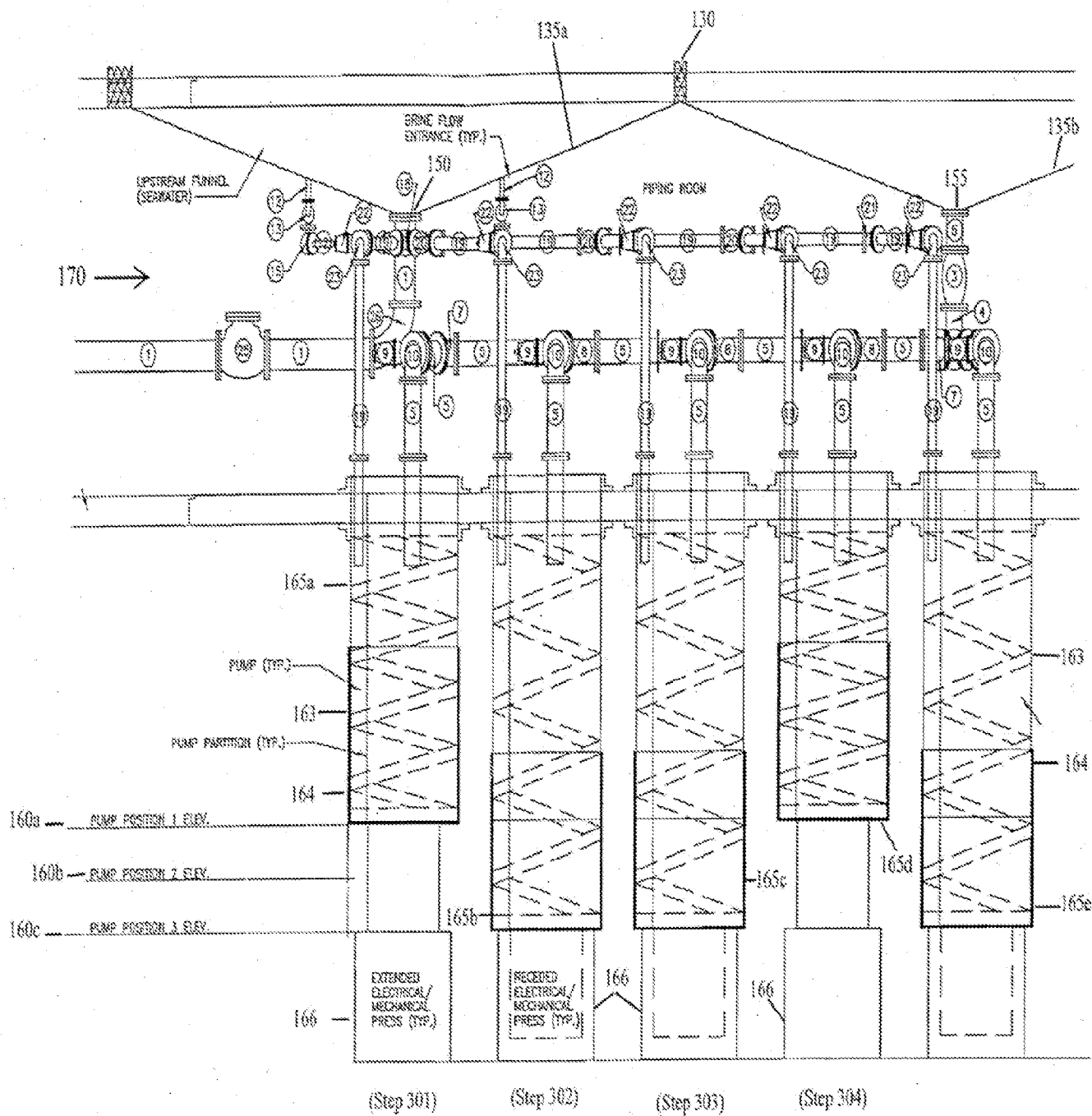


FIG. 3B

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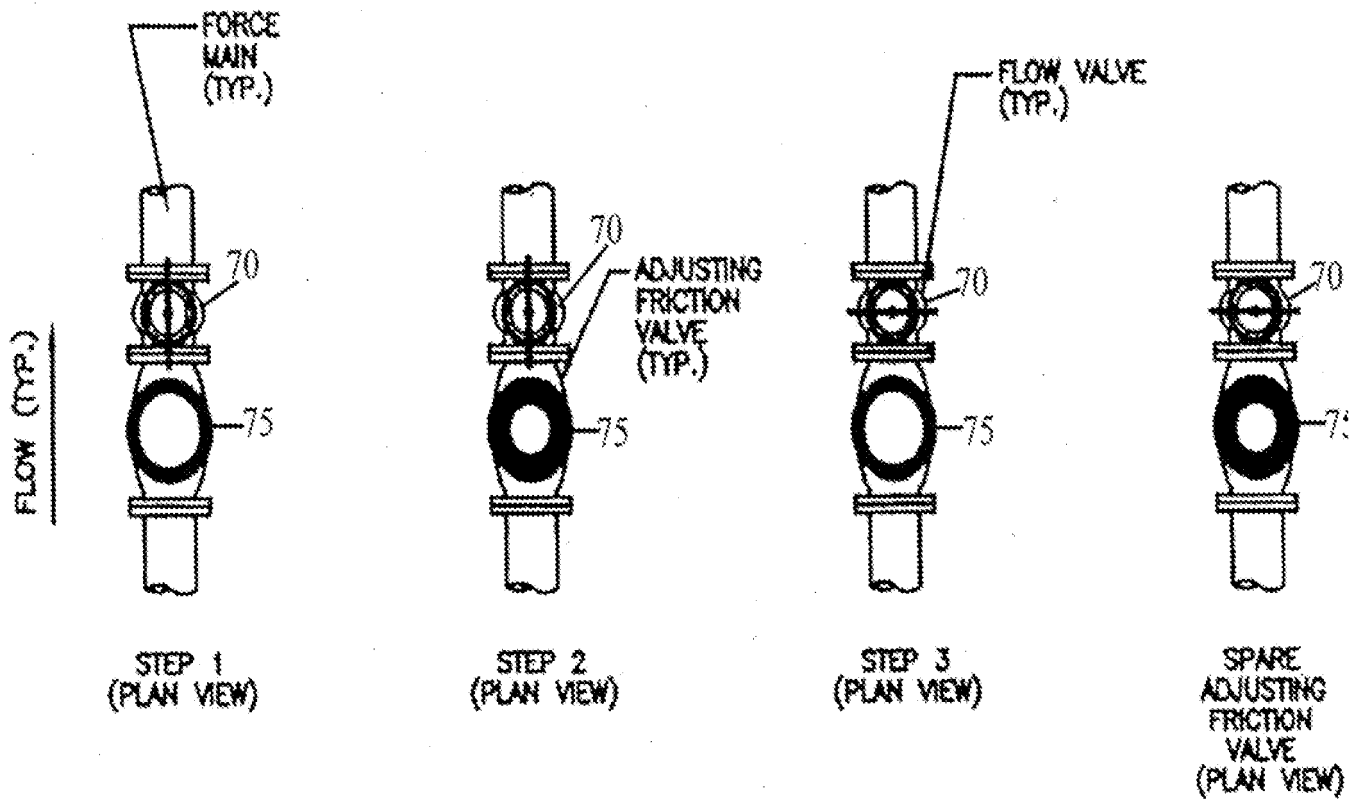
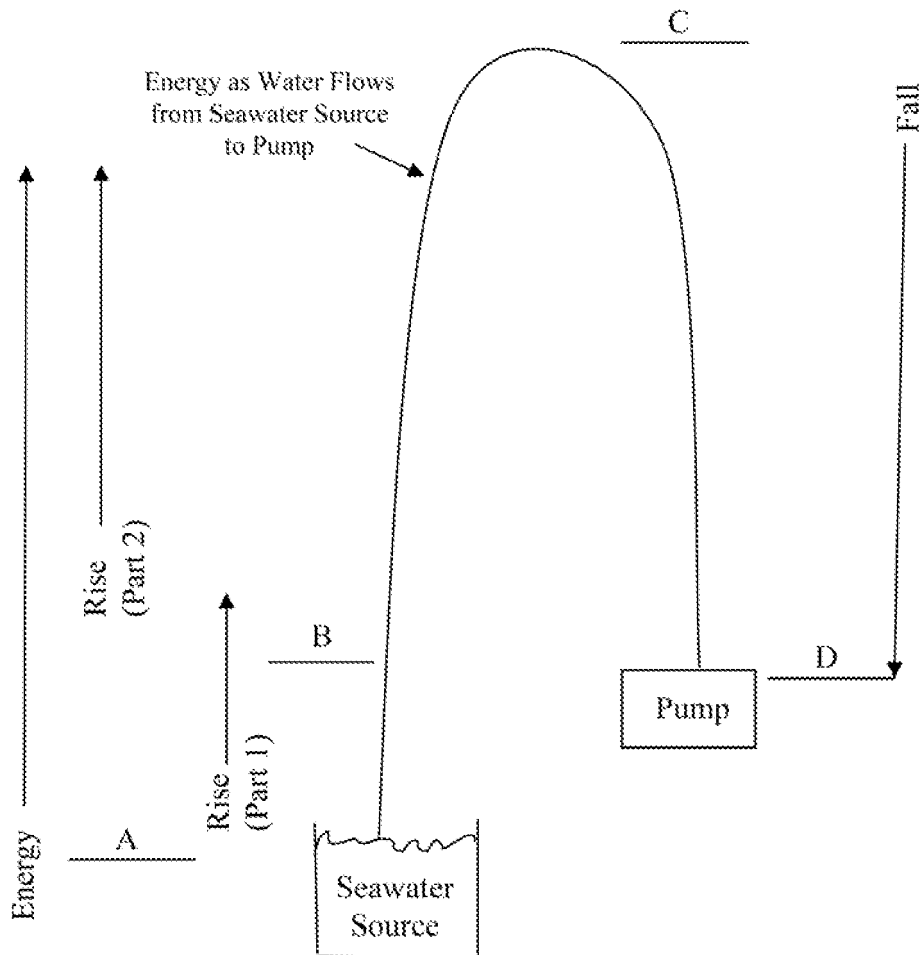


FIG. 4

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THERMODYNAMIC SIPHON FOR HYDRAULIC DESALINATION

$$\text{Rise (Part 1)} = B - A;$$

$$\text{Rise (Part 2)} = C - B;$$

$$\text{Fall} = D - C;$$

$$\text{Overall Difference} = \text{Rise (Part 1)} + \text{Rise (Part 2)} + \text{Fall};$$

$$\text{Overall Difference} = (B - A) + (C - B) + (D - C);$$

$$B = D;$$

$$\text{Overall Difference} = (B - A) + C - B + (B - C);$$

$$(C - B) + (B - C) = 0, \text{ so Rise (Part 2) is cancelled by Fall};$$

Rise (Part 2) represents evaporation, and Fall represents condensation, so evaporation is cancelled by condensation;

Overall Difference = $D - A$, which represents the TDH that needs to be provided by the pump during Hydraulic Desalination

FIG. 5

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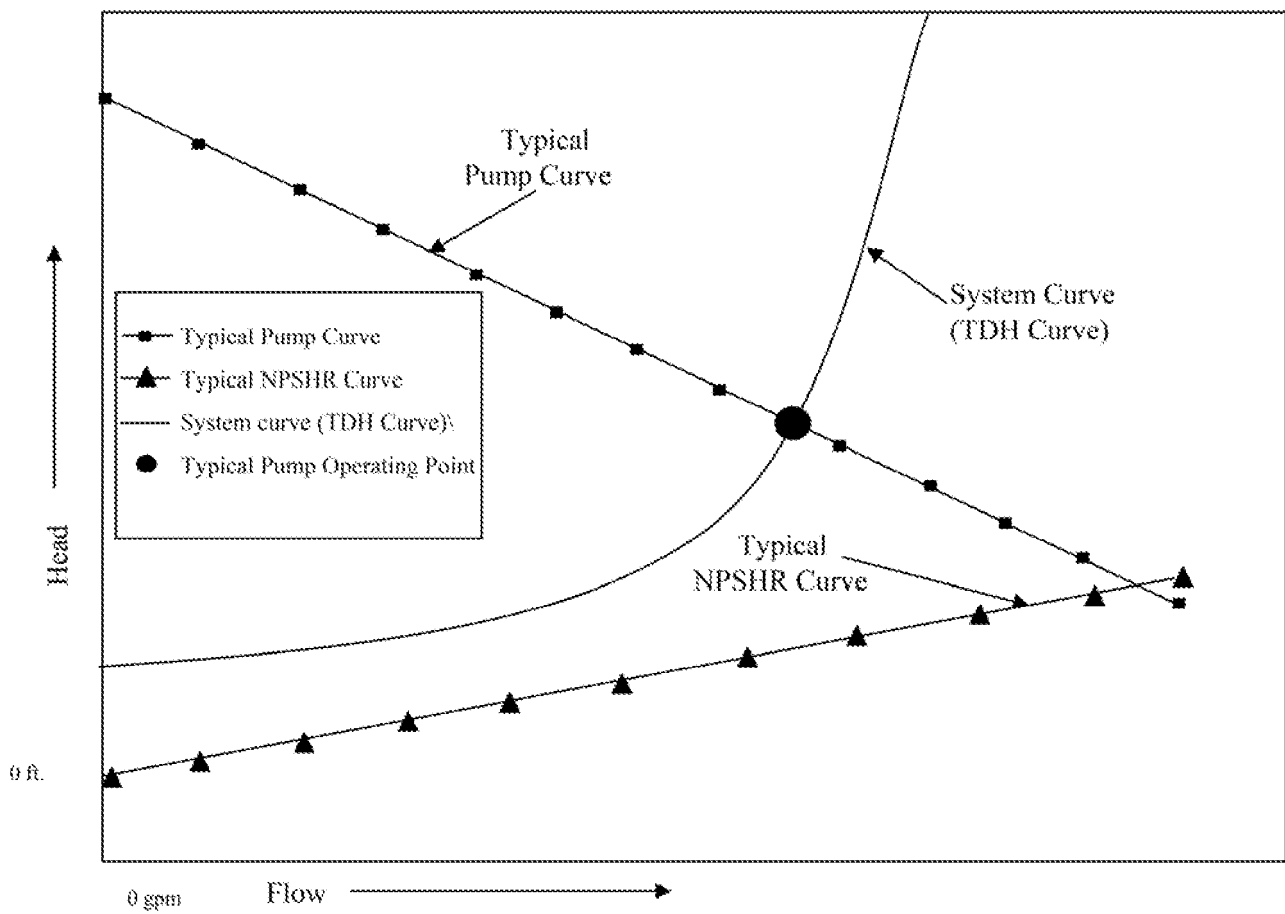
TYPICAL PUMP AND NPSHR CURVES

FIG. 6: Typical Pump and NPSHR Curves

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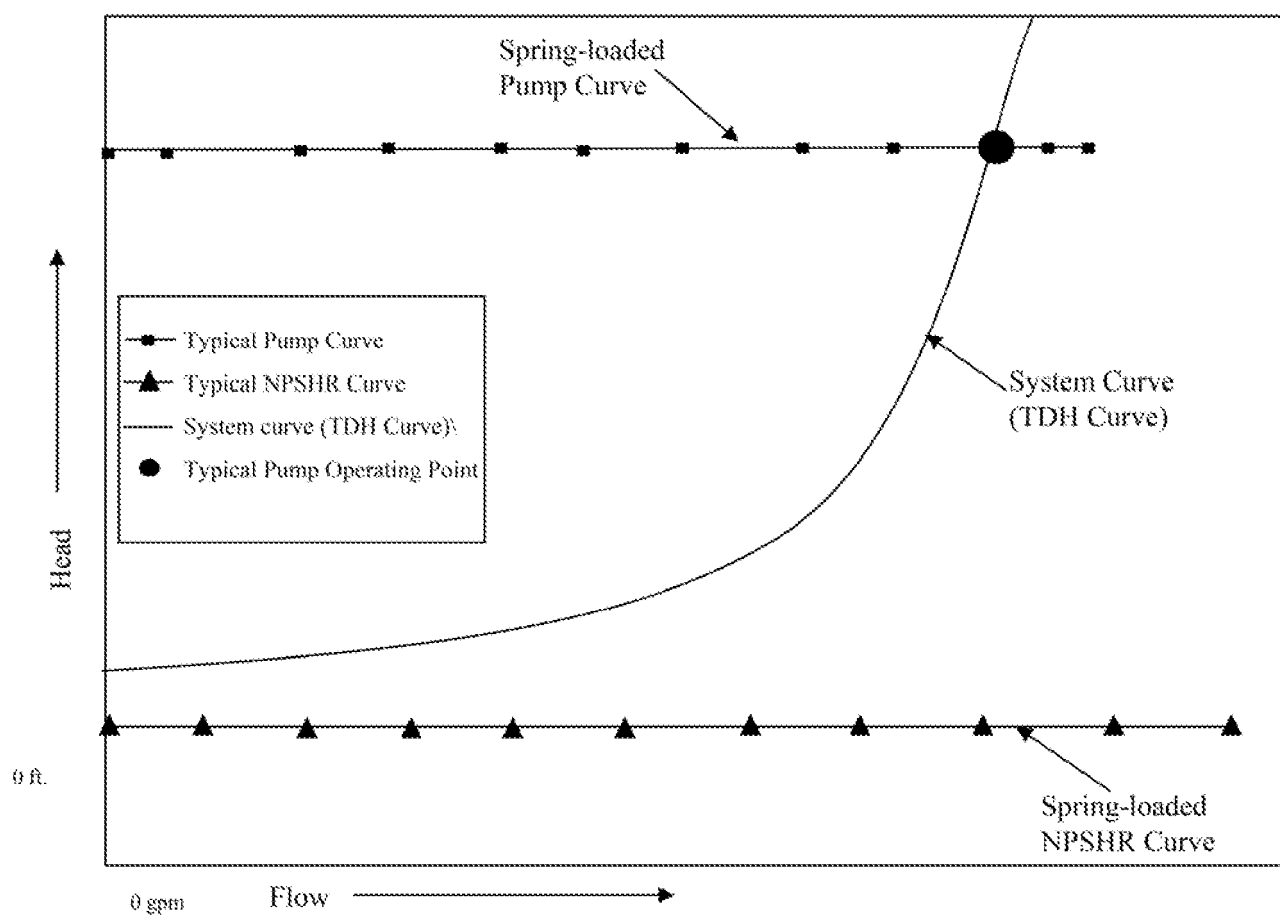
SPRING-LOADED PUMP AND NPSHR CURVES

FIG. 7: Example Spring-Loaded Pump and NPSHR Curves

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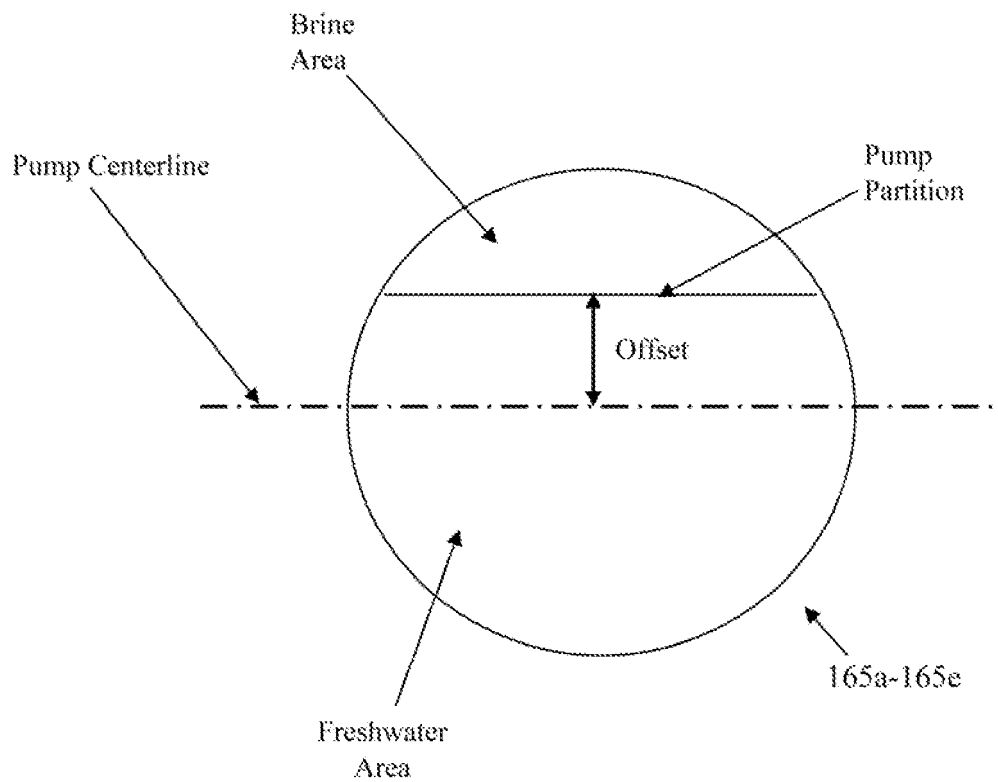


FIG .8

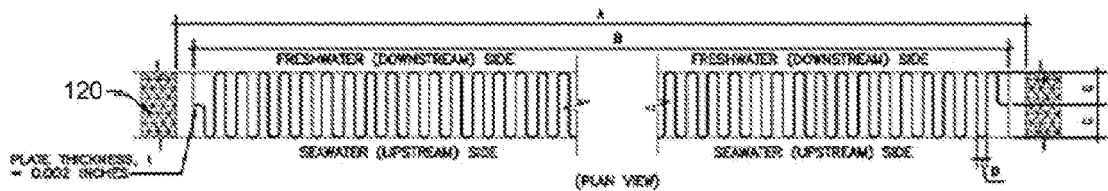
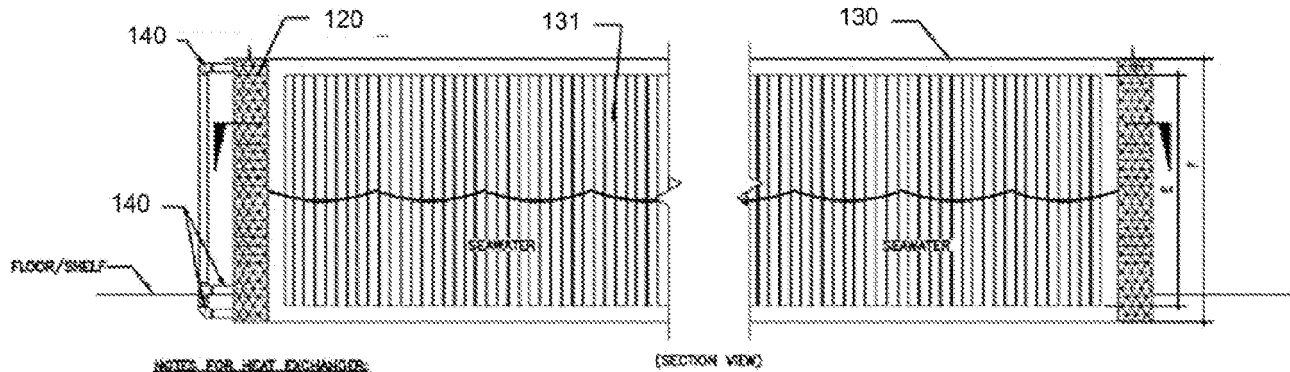


FIG. 9A



NOTES FOR HEAT EXCHANGER:

- 1. THICKNESS *t* AND DIMENSIONS IN TABLE BASED ON STAINLESS STEEL PLATE HEAT EXCHANGER CONFIGURED AS SHOWN.
- 2. HEAT FLOW IN TABLE REFERS TO AMOUNT OF HEAT TRANSFERRED THROUGH HEAT EXCHANGER FROM FRESHWATER SIDE TO SEAWATER SIDE DURING HYDRAULIC DESALINATION.
- 3. ΔT IN TABLE IS THE TEMPERATURE DIFFERENCE BETWEEN THE FRESHWATER SIDE AND SEAWATER SIDE OF THE EXCHANGER DURING HYDRAULIC DESALINATION, WITH THE FRESHWATER SIDE HAVING THE HIGHER TEMPERATURE.
- 4. DURING INITIAL TANK EVACUATION, HEATERS AND CONDUITS OUTSIDE OF THE VAPORIZATION TANK SUPPLY HEAT TO THE HEAT EXCHANGER, THEREBY PROVIDING THE HEAT NECESSARY FOR INITIAL TANK EVACUATION.

APPLICATION	HEAT EXCHANGER DIMENSIONS (INCHES)						PERFORMANCE CRITERIA	
	A	B	C	D	E	F	HEAT FLOW (KW)	ΔT (°F)
1,200 GPM STATIONS	552	540	3	3/8	84	88	168,000	2.0
8 GPM UNITS	48	47	1/4	1/16	23	24	1,120	1.1

HEAT EXCHANGER DETAIL

NOT TO SCALE

FIG. 9B