



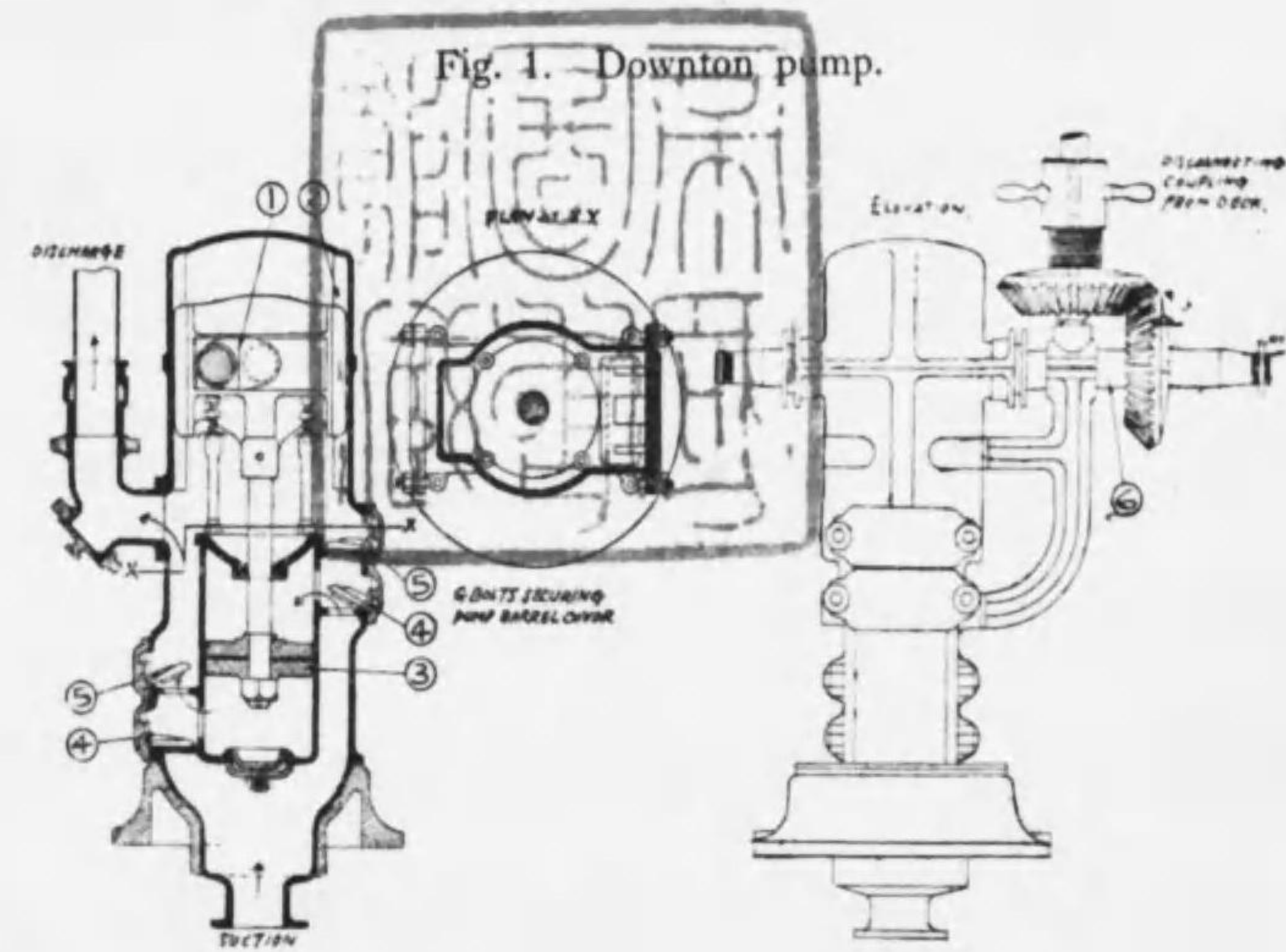
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航海科 機關學 附圖

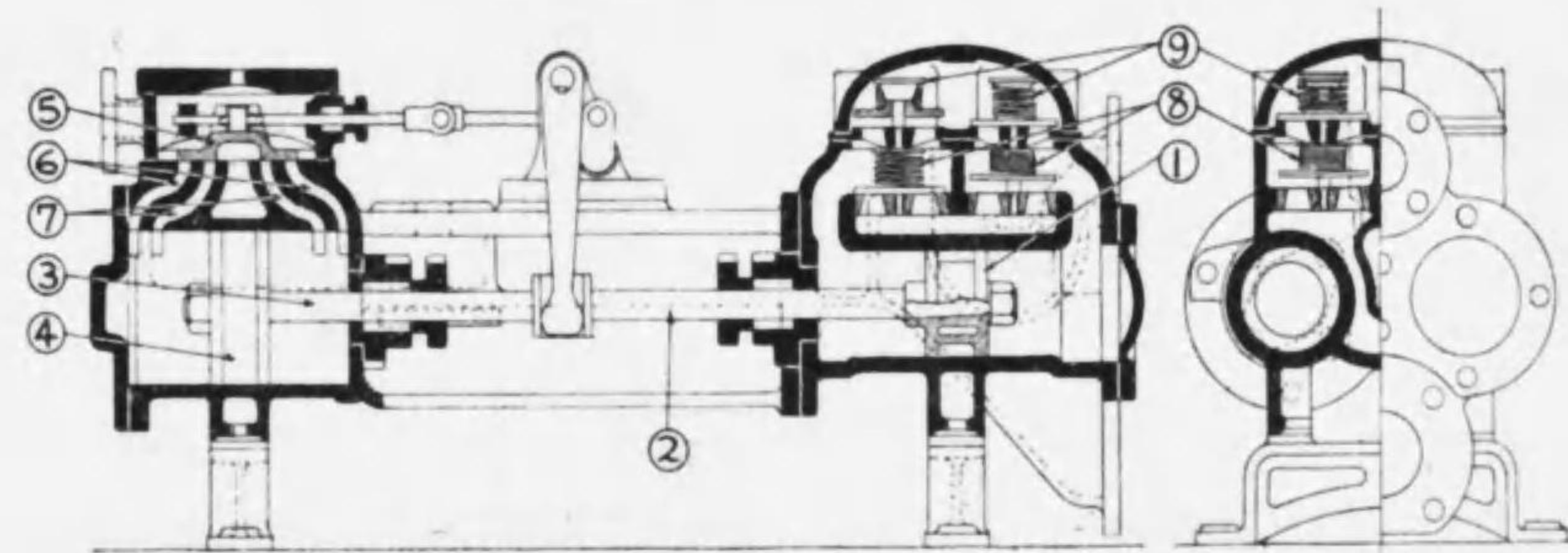
神戸高等商船學校





- 1. Crank.
- 2. Guide.
- 3. Piston.
- 4. Suction valve.
- 5. Delivery valve.

Fig. 2. Worthington pump.

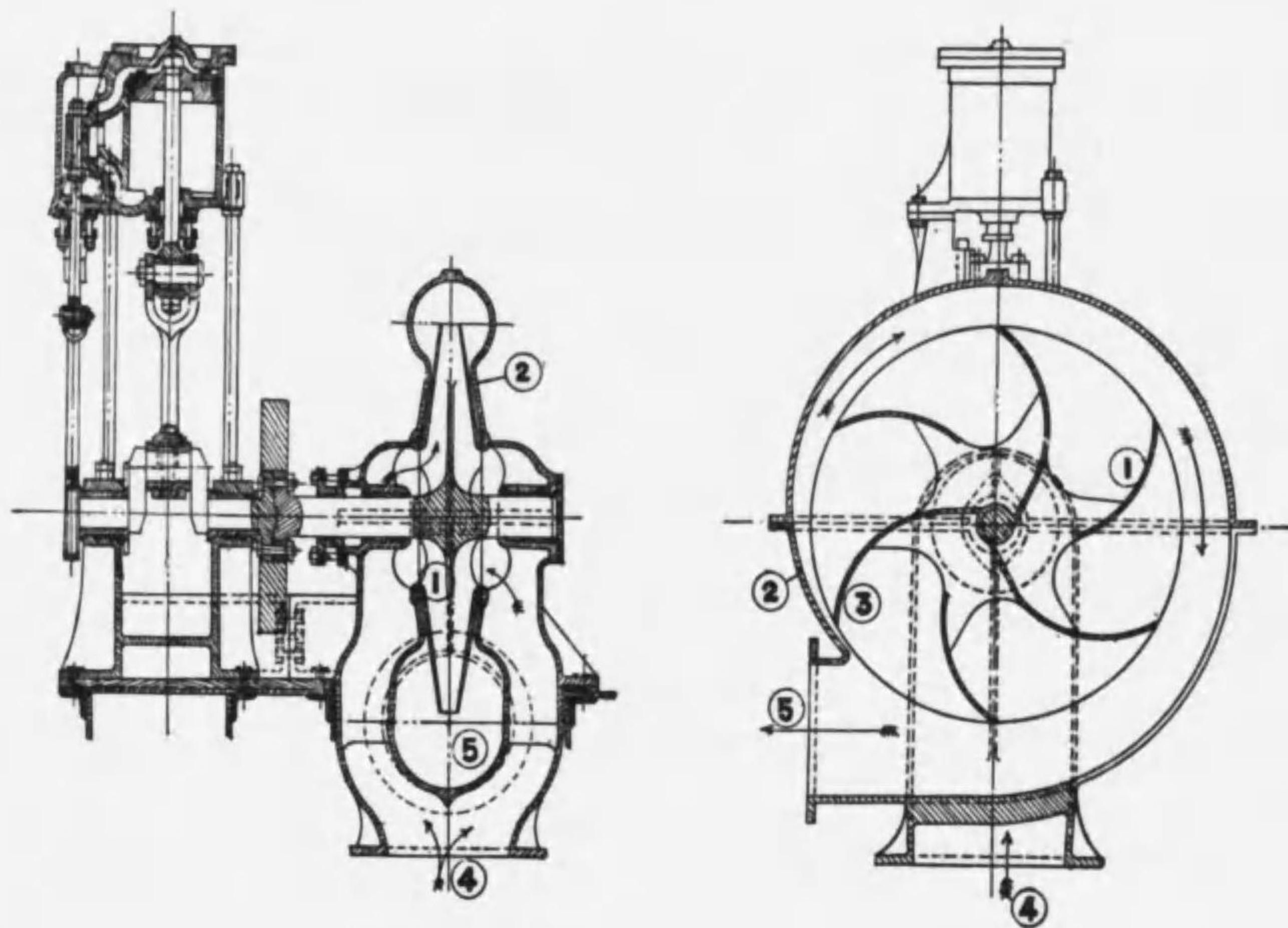


- 1. Water piston.
- 2. Water piston rod.
- 3. Steam piston rod.
- 4. Steam piston.
- 5. Slide valve.
- 6. Steam port.
- 7. Exhaust port.
- 8. Suction valve.
- 9. Delivery valve.



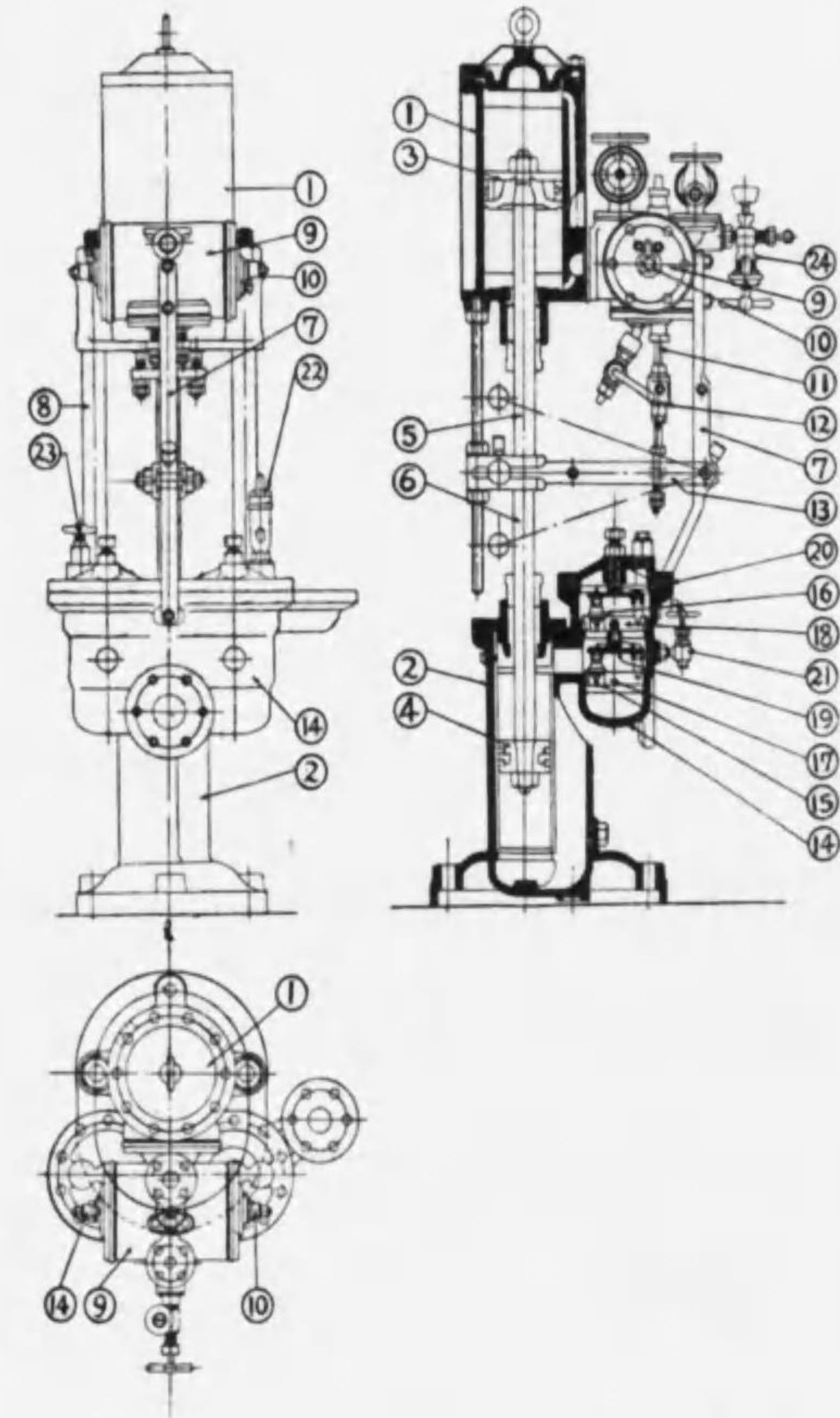


Fig. 3.  
Centrifugal pump.



- |                   |                  |
|-------------------|------------------|
| 1. Impeller.      | 2. Pump casing.  |
| 3. Vane.          | 4. Suction pipe. |
| 5. Delivery pipe. |                  |

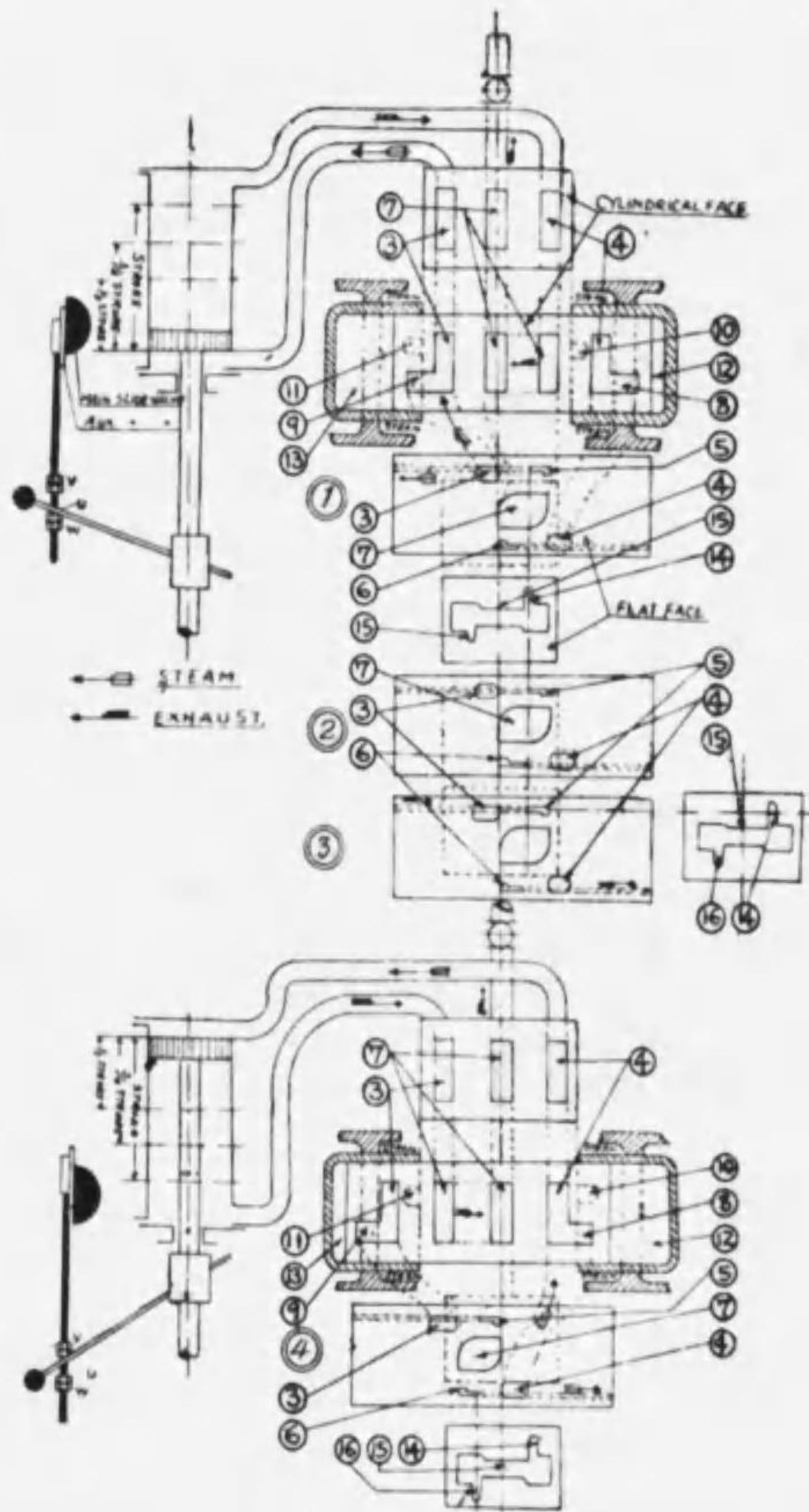
Fig. 4. Weir's pump.  
(A) General construction.



- |                           |                         |
|---------------------------|-------------------------|
| 1. Steam cylinder.        | 2. Water cylinder.      |
| 3. Steam piston.          | 4. Water piston.        |
| 5, 6. Piston rod.         | 7. Front stay.          |
| 8. Stay or stantion.      | 9. Valve casing.        |
| 10. Bye-pass gear.        | 11. Valve spindle.      |
| 12. Double joint.         | 13. Ball rod.           |
| 14. Water side valve box. | 15. Suction valve.      |
| 16. Delivery valve.       | 17. Suction valve seat. |
| 18. Delivery valve seat.  | 19. Valve guard.        |
| 20. Valve box cover.      | 21. Air valve.          |
| 22. Escape valve.         | 23. Air plug.           |
| 24. Oil lubricator.       |                         |



Fig. 4. (B) Working.



- 3, 4. Steam port.
- 5, 6. Port to main valve end.
- 7. Exhaust port.
- 8, 9. Port for bye-pass.
- 10, 11. Port for bye-pass.
- 12, 13. Cap.
- 14, 15, 16. Passage on aux. valve.

Fig. 5. Gear pump.



- 1. Gog or gear wheel.
- 2. " " " "
- 3. Suction pipe.
- 4. Delivery pipe.

Fig. 6.

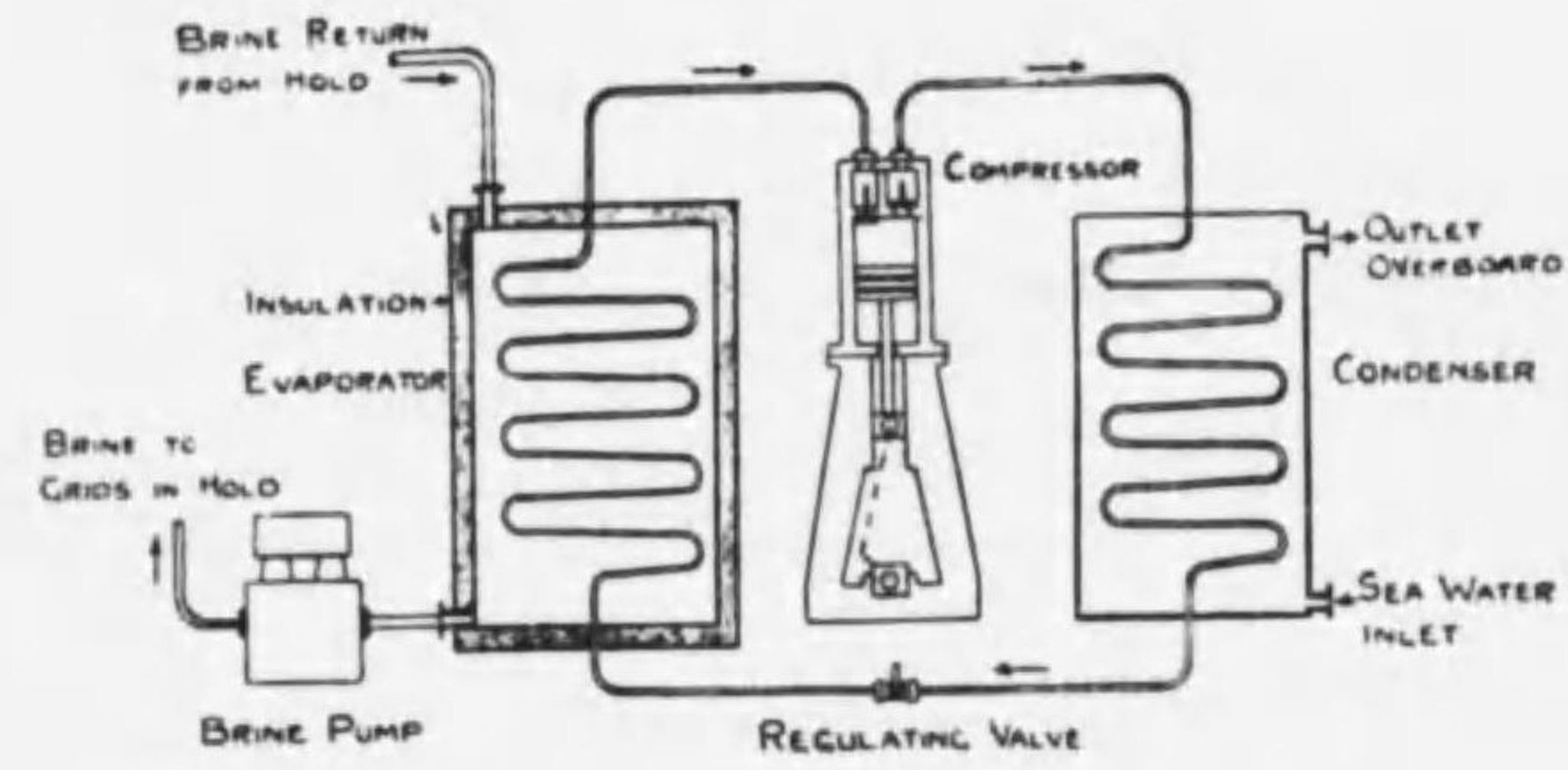


Diagram of Ammonia or carbon dioxide (Co<sub>2</sub>)  
Refrigerating system.

Fig. 7.

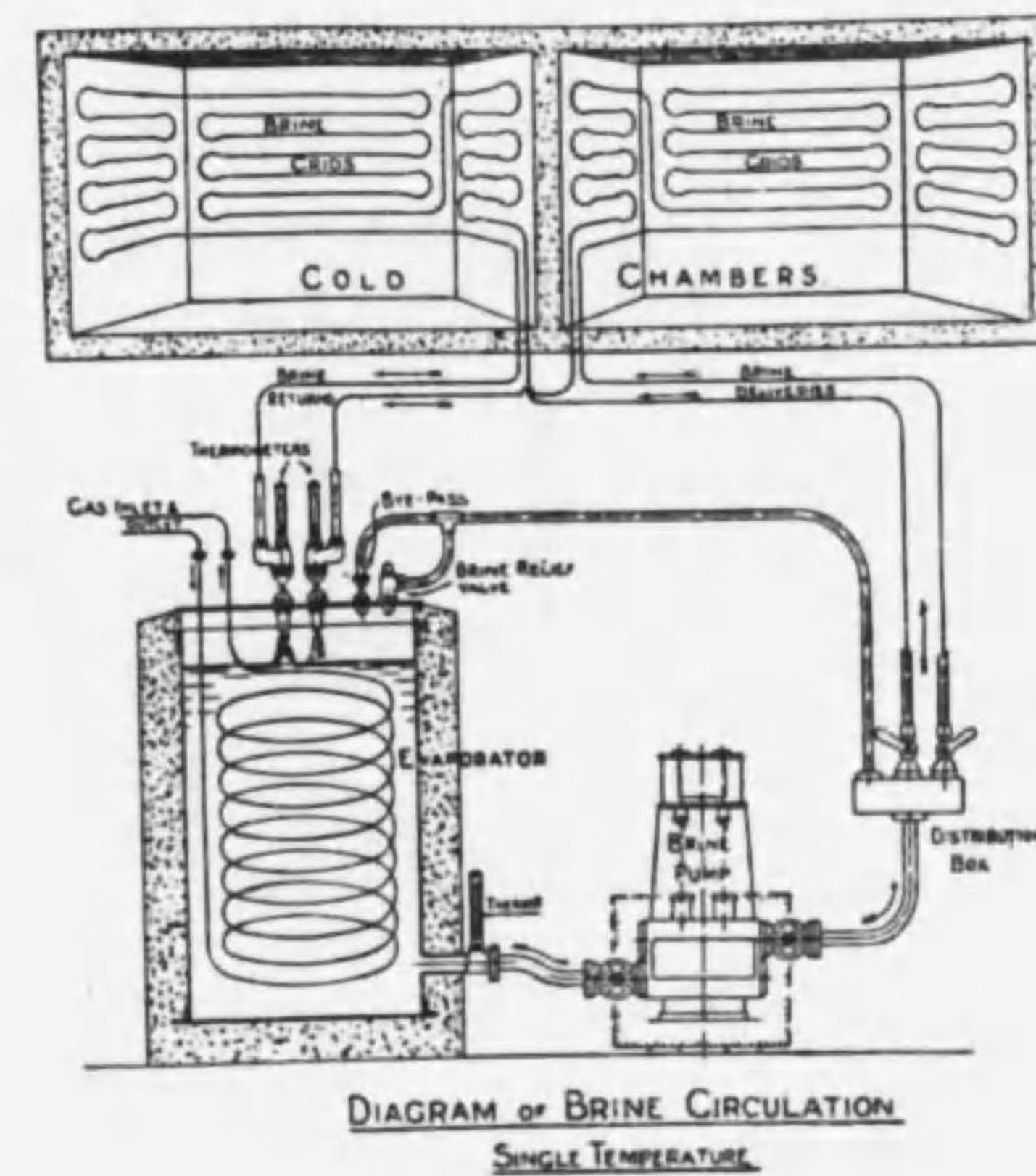
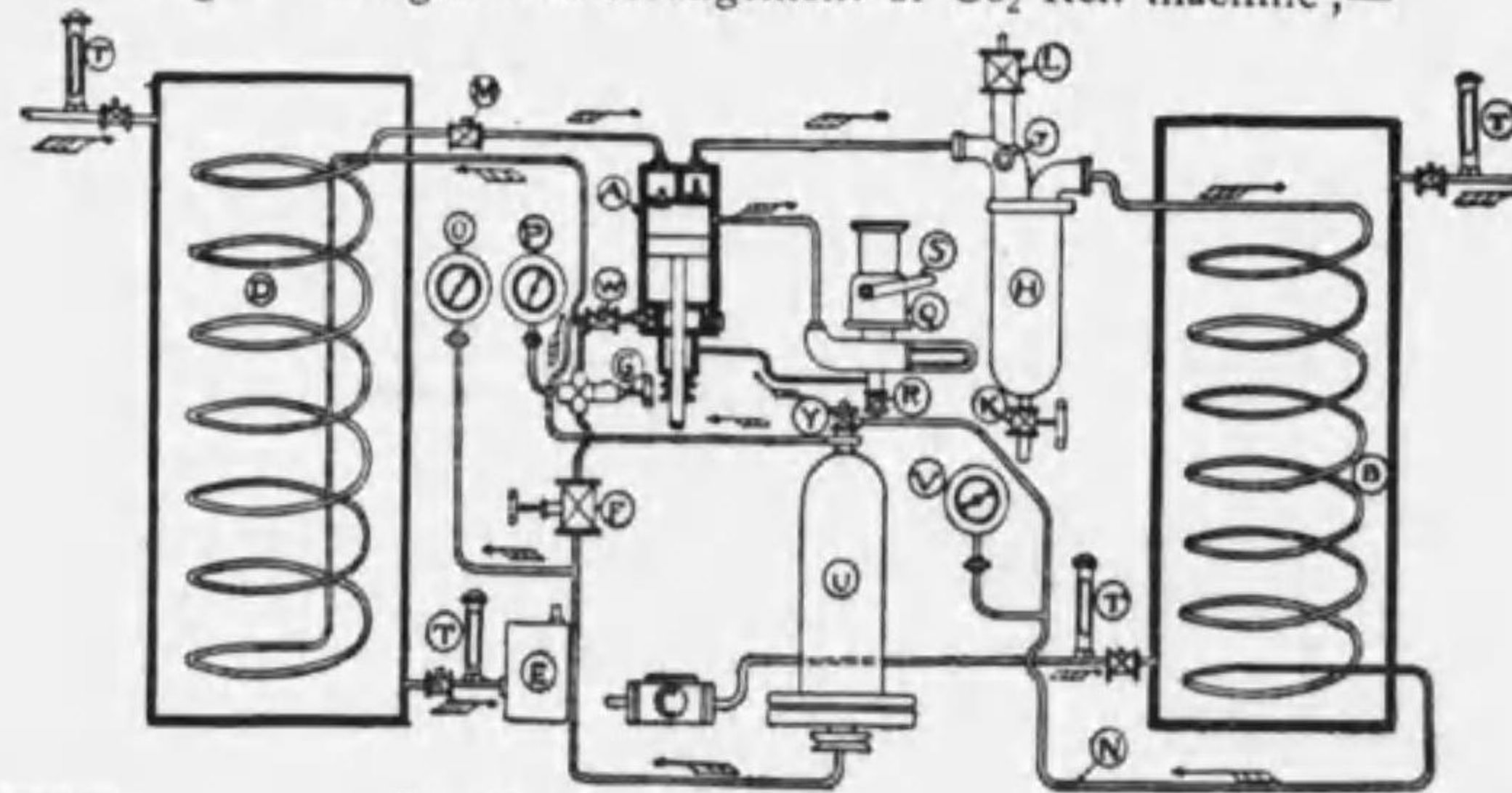


DIAGRAM OF BRINE CIRCULATION  
SINGLE TEMPERATURE

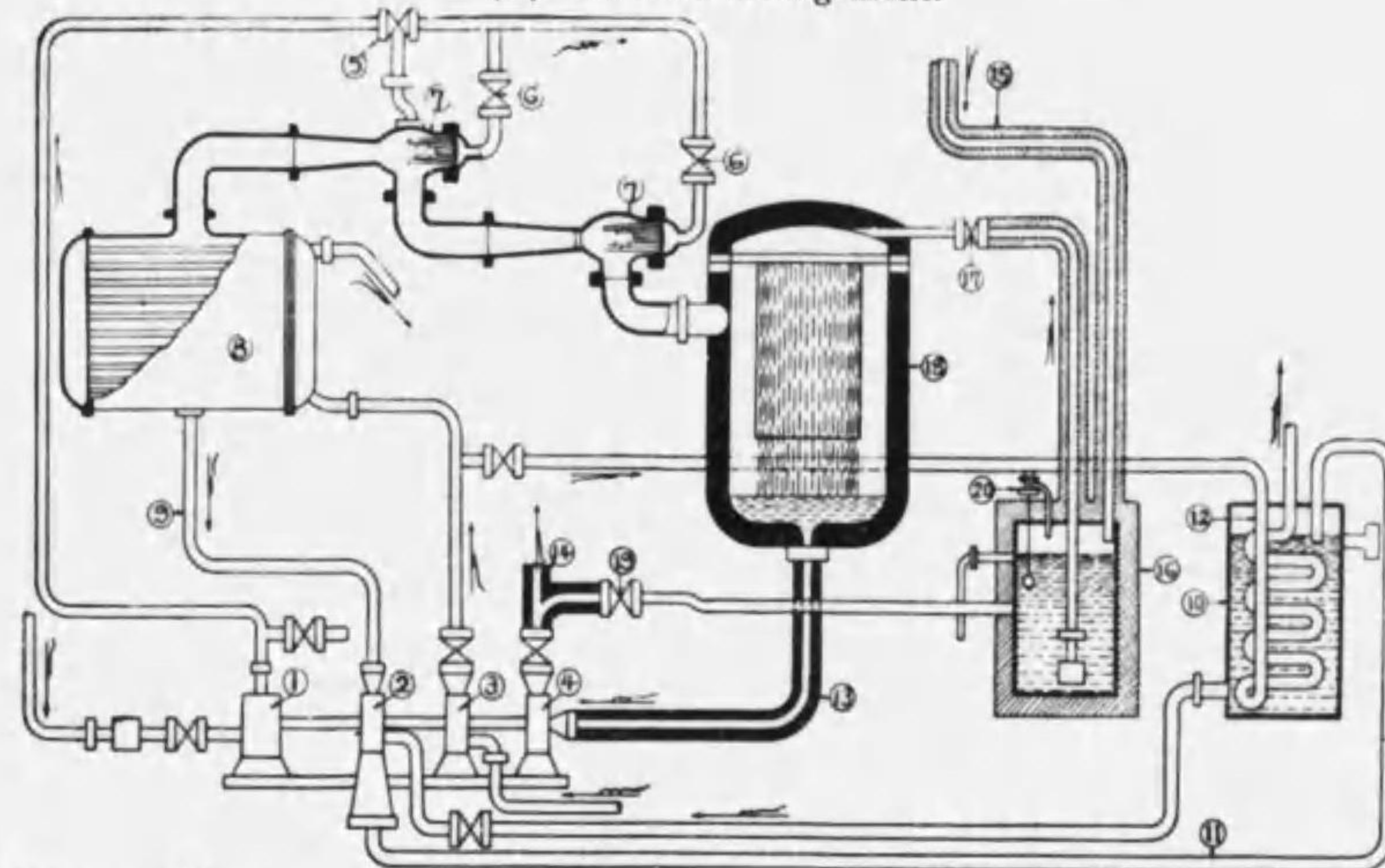


Fig. 8. Diagrammatic arrangement of Co<sub>2</sub> Ref. machine;—



- |  |                                      |                                      |
|--|--------------------------------------|--------------------------------------|
| A. Compressor.                             | B. Condenser.                        | C. Circulating pump                  |
| D. Evaporator.                             | E. Brine pump.                       | F. 2 <sup>nd</sup> Regulating valve. |
| G. Charging valve.                         | H. Oil separator.                    | J. Safety valve.                     |
| K. Drain valve.                            | L. Delivery stop valve.              | M. Suction stop valve.               |
| N. Liquid pipe.                            | O. Receiver pressure gauge.          | P. Evaporator pressure gauge         |
| Q. Lubricator.                             | R. Oil regulating valve.             | S. Lubricator pump handle.           |
| T. Thermometer.                            | U. Multiple effect liquid receiver.  | V. Condenser pressure gauge.         |
| W. Multiple effect gas suction stop valve. | Y. 1 <sup>st</sup> Regulating valve. |                                      |

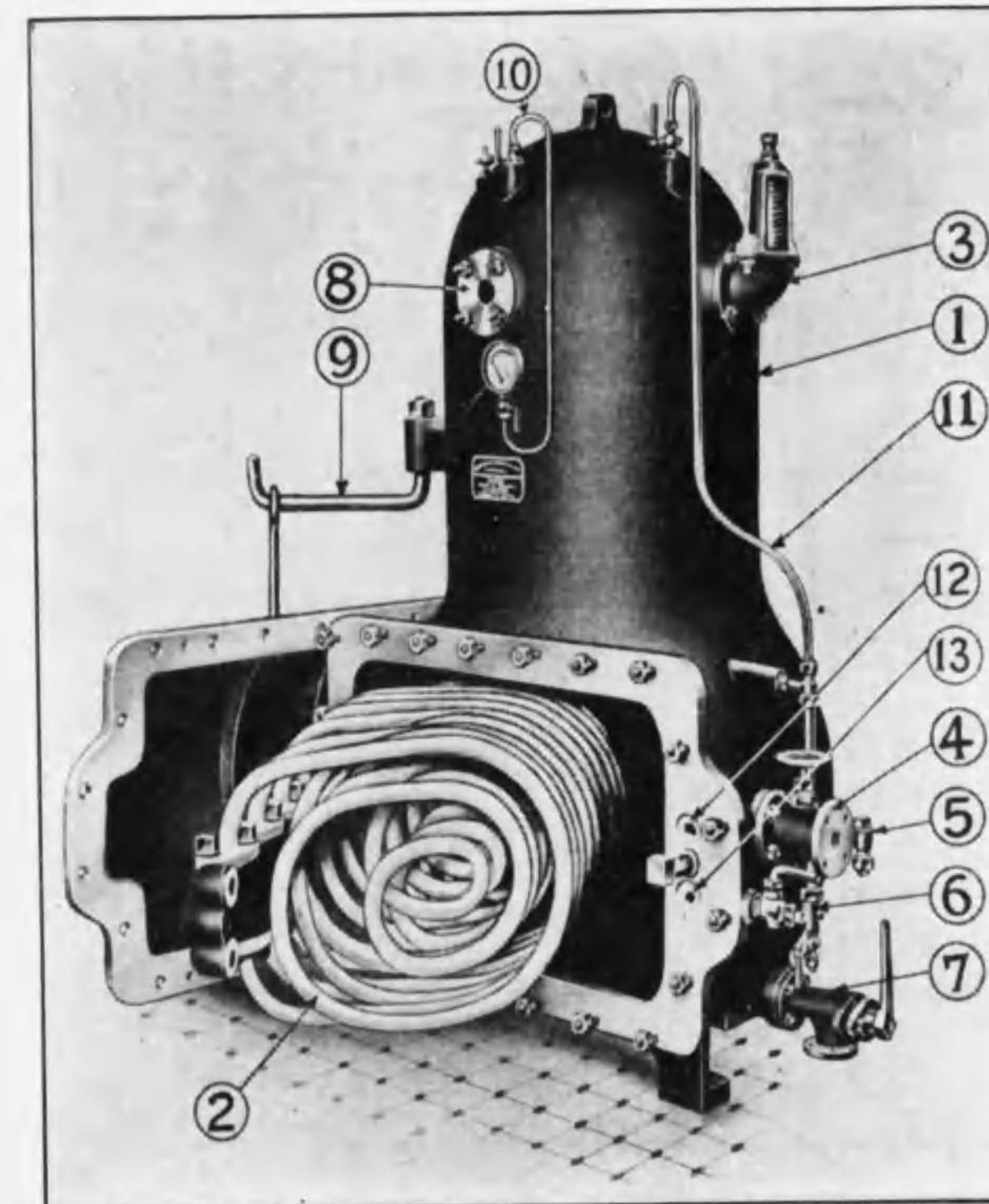
Fig. 9. Le Blanc vacuum system Ref. machine.  
(A) General arrangement.



- |                         |                               |                              |
|-------------------------|-------------------------------|------------------------------|
| 1. Steam turbine.       | 2. Patent air pump.           | 3. Circulating pump.         |
| 4. Brine pump.          | 5. Automatic shut off valve.  | 6. Automatic reducing valve. |
| 7. Steam ejector.       | 8. Condenser.                 | 9. Pipe from 8 to 2.         |
| 10. Fresh water tank.   | 11. Air pump discharge pipe.  | 12. Cooling pipe.            |
| 13. Brine suction pipe. | 14. Brine pump delivery pipe. | 15. Brine return pipe.       |
| 16. Brine tank.         | 17. Regulating valve.         | 18. Evaporator.              |
| 19. Bye pass valve.     | 20. Sea water supply valve.   |                              |

Fig. 10.

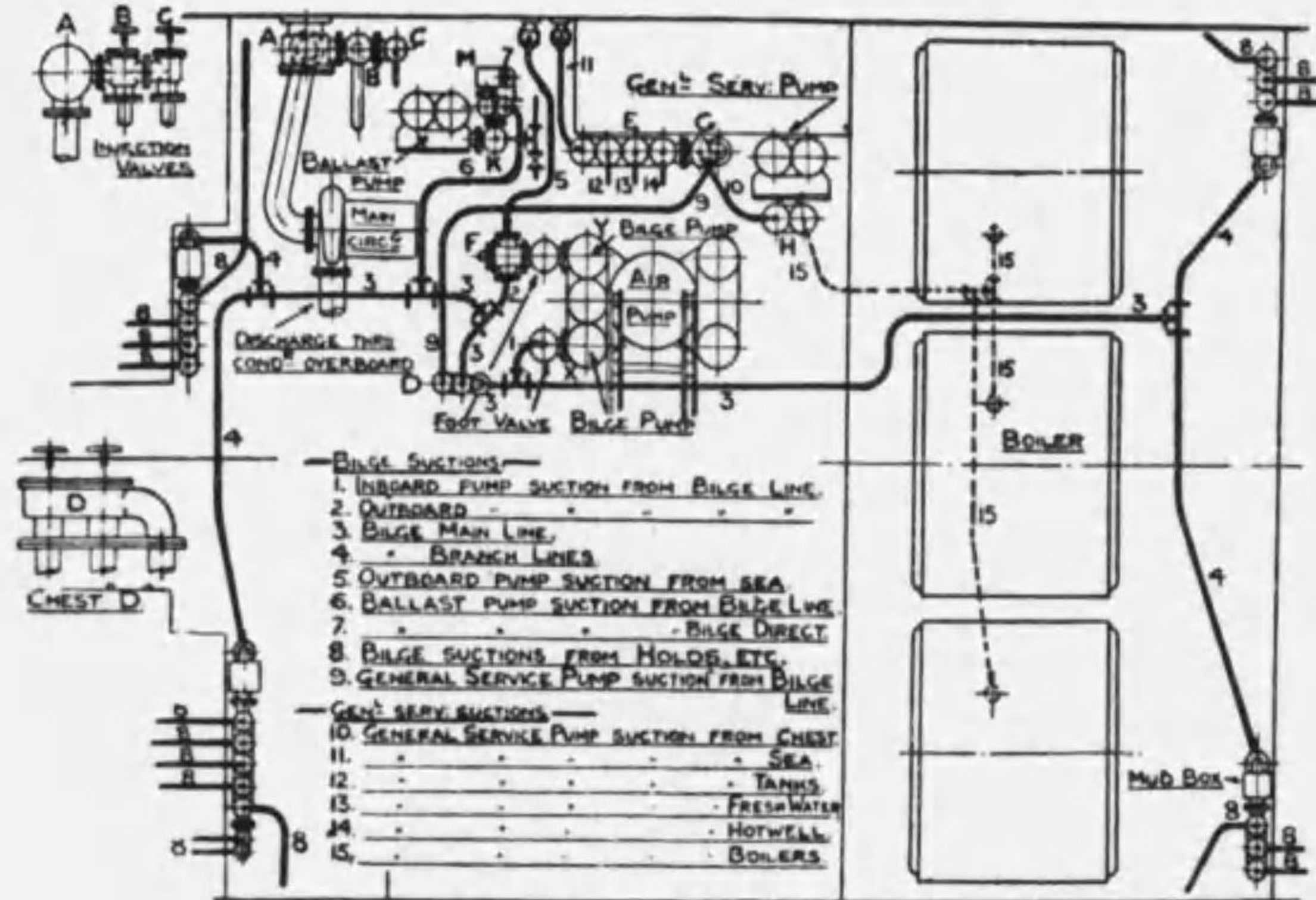
Morison's evaporator.



- |                        |                              |
|------------------------|------------------------------|
| 1. Evaporator shell.   | 8. Secondary steam outlet.   |
| 2. " coil.             | 9. Swing crane bar for door. |
| 3. Steam escape valve. | 10. Compound gauge.          |
| 4. Steam inlet valve.  | 11. Water gauge.             |
| 5. Feed check valve.   | 12. Spigot for inlet steam.  |
| 6. Drain outlet valve. | 13. Spigot for drain outlet. |
| 7. Blow cock.          |                              |



Fig. 11. Pipe arrangement.  
(A) Bilge pipe arrangement.



(B) Ballast & fresh water pipe arrangement.

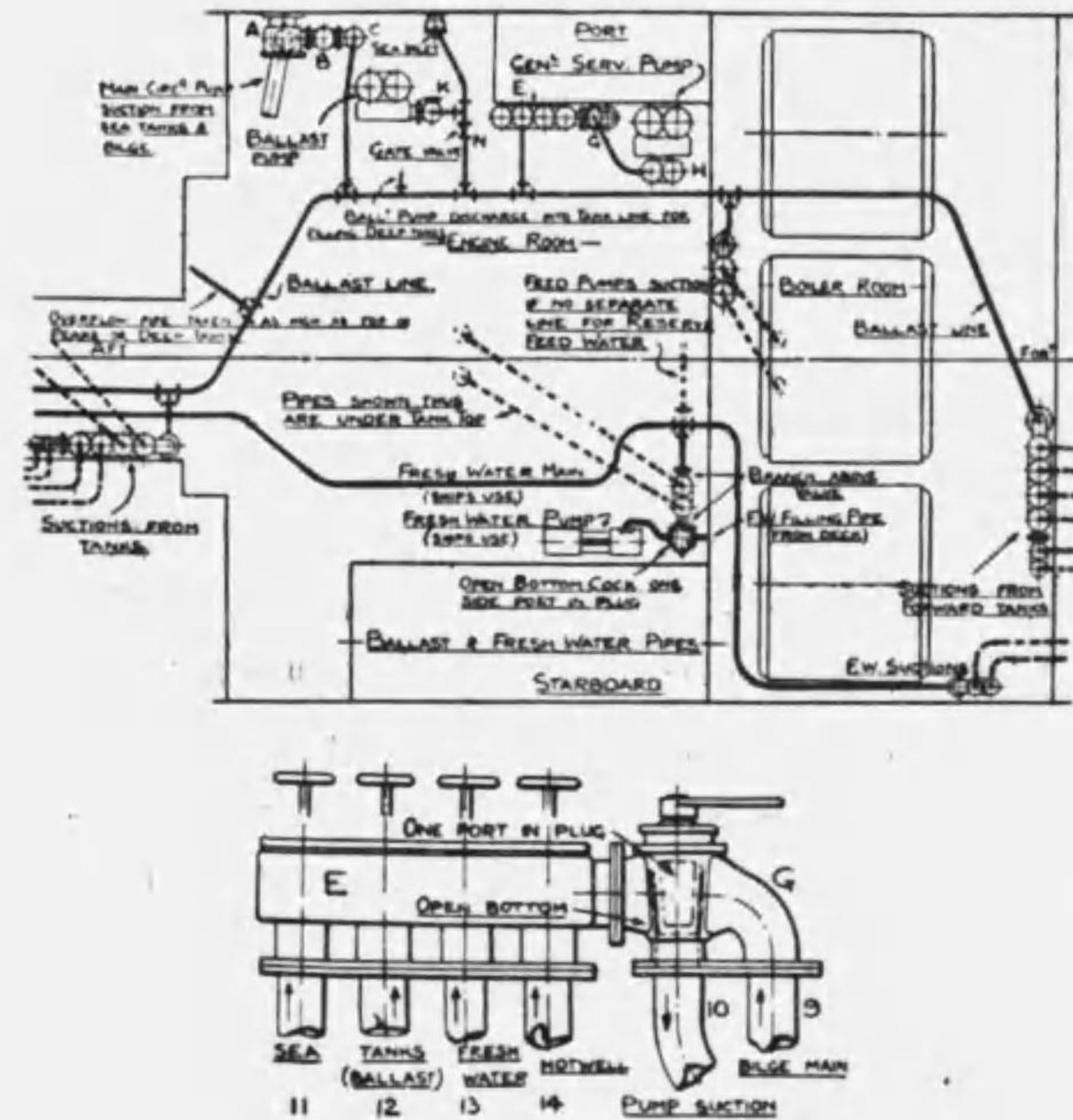


Fig. 12. (A) Brown's patent telemotor (New type).

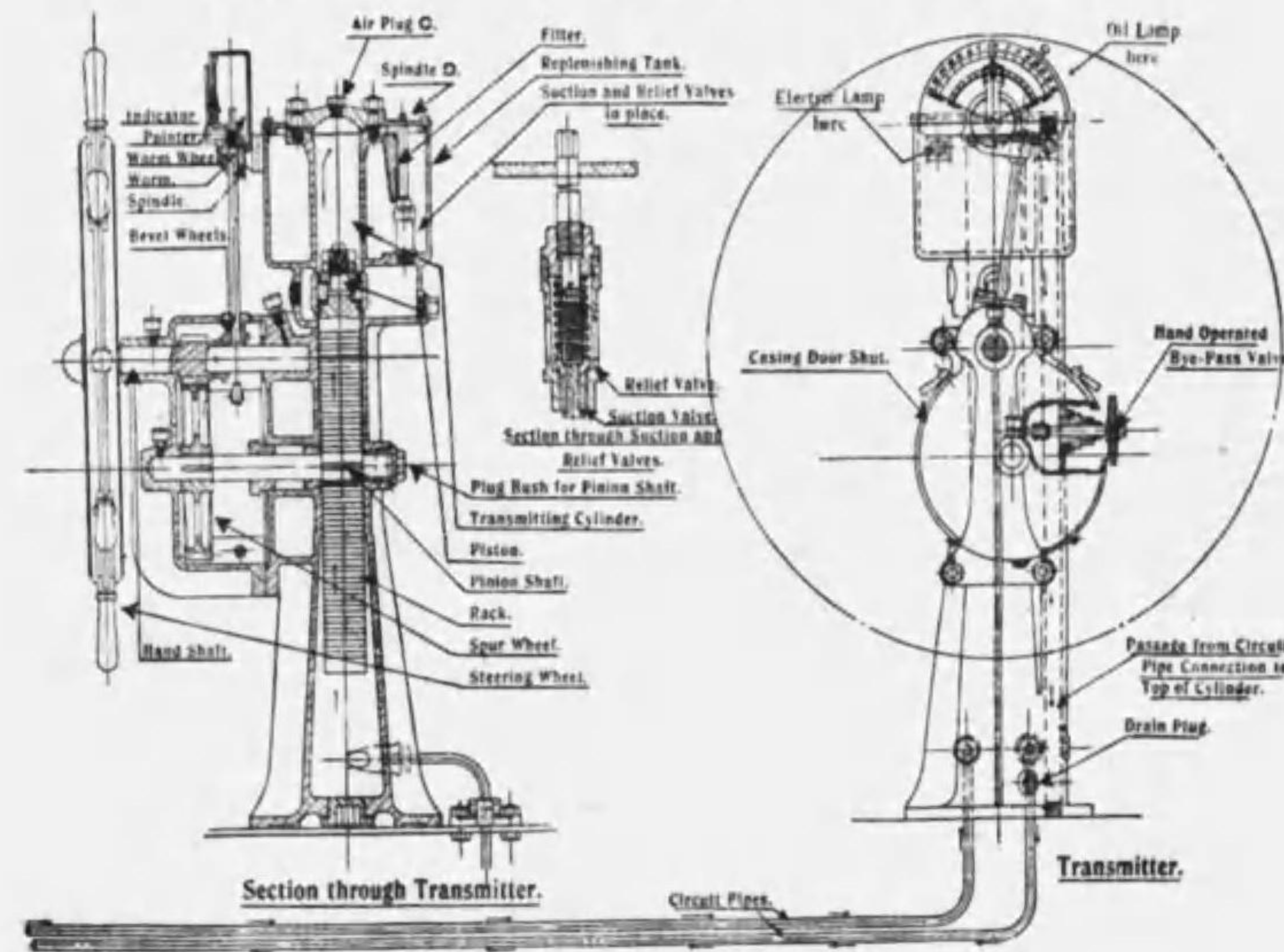
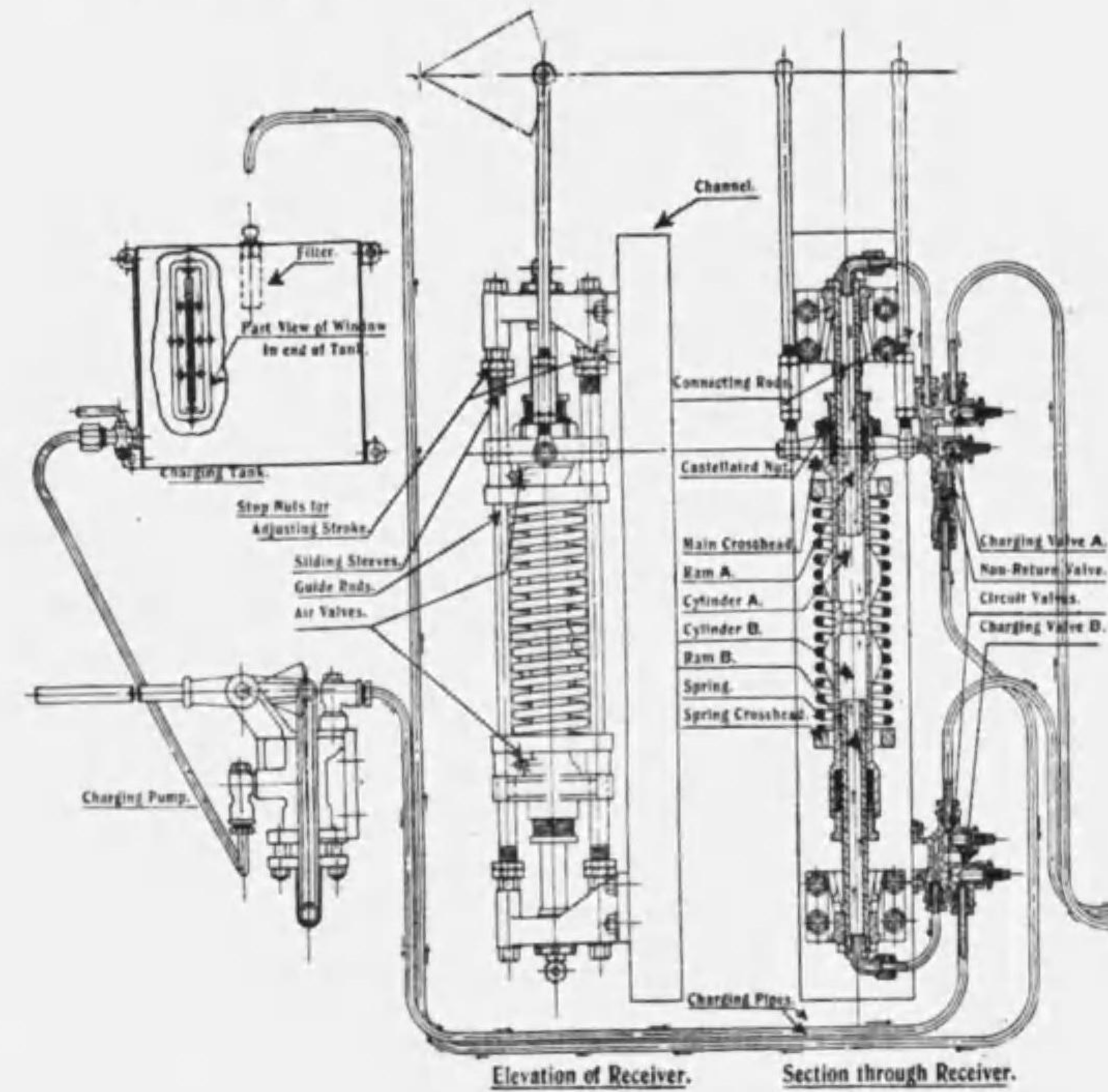


Fig. 12. (B) Brown's patent motor-telemotor (New type).





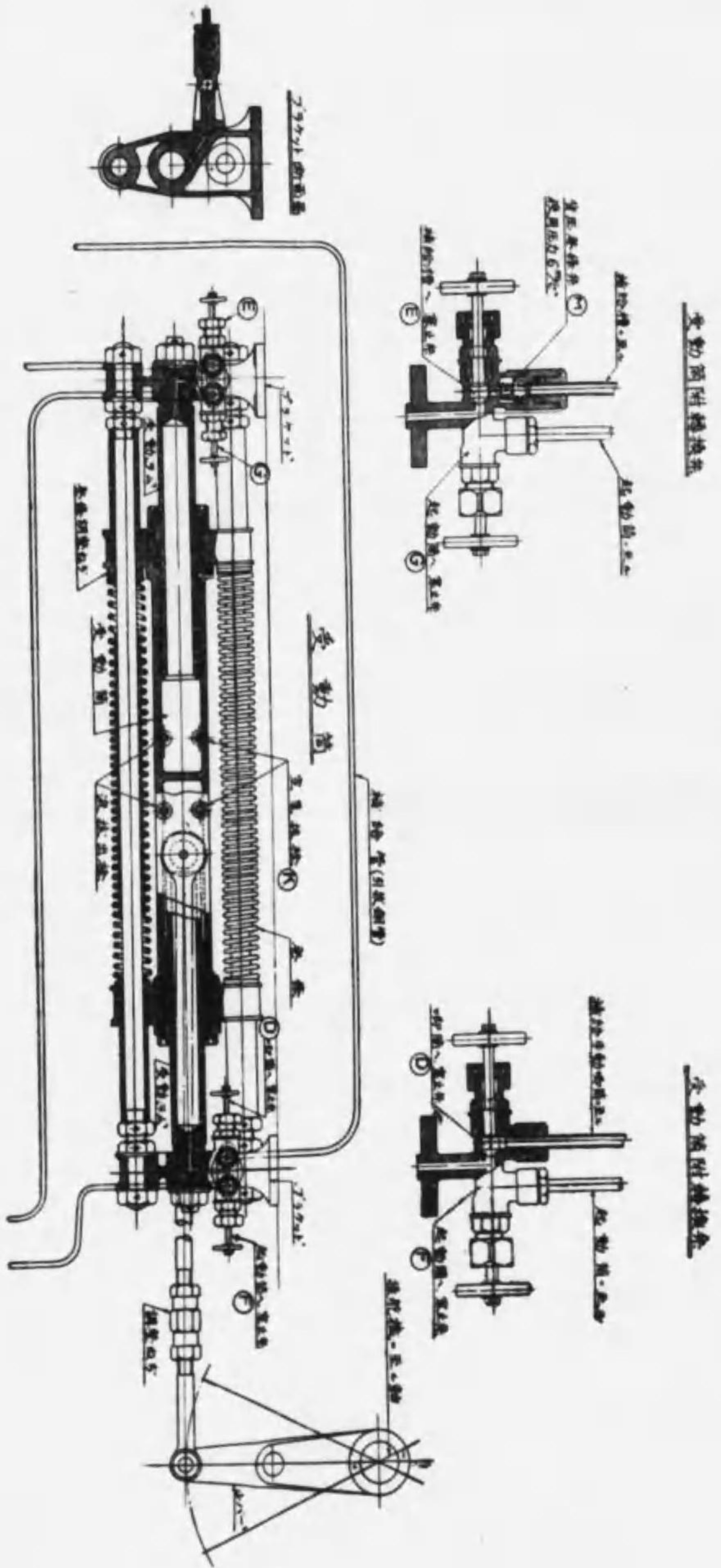


Fig. 13. (B)

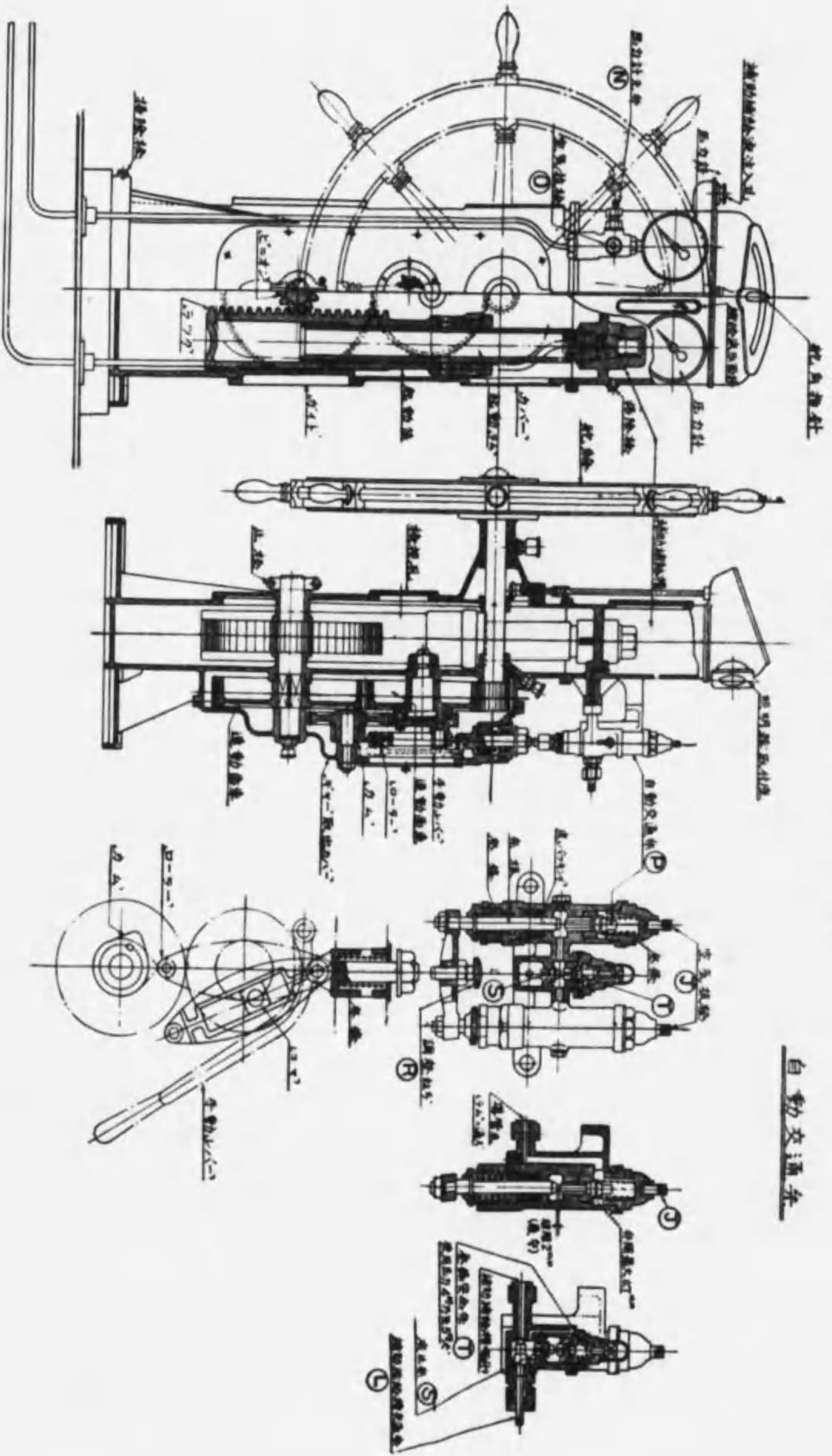
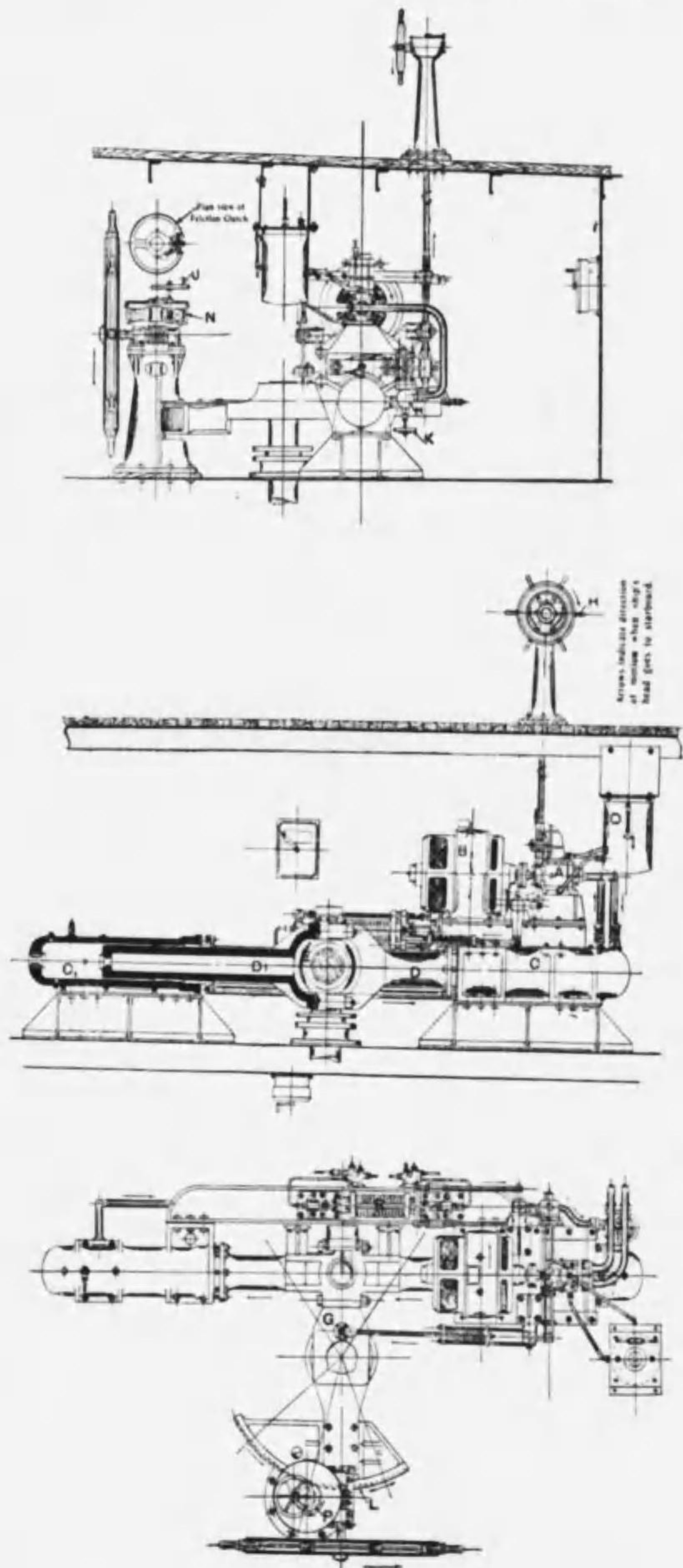


Fig. 13. (A)  
浦賀式操舵「テレモーター」系統圖



Fig. 14. William Janney electric hydraulic steering gear.

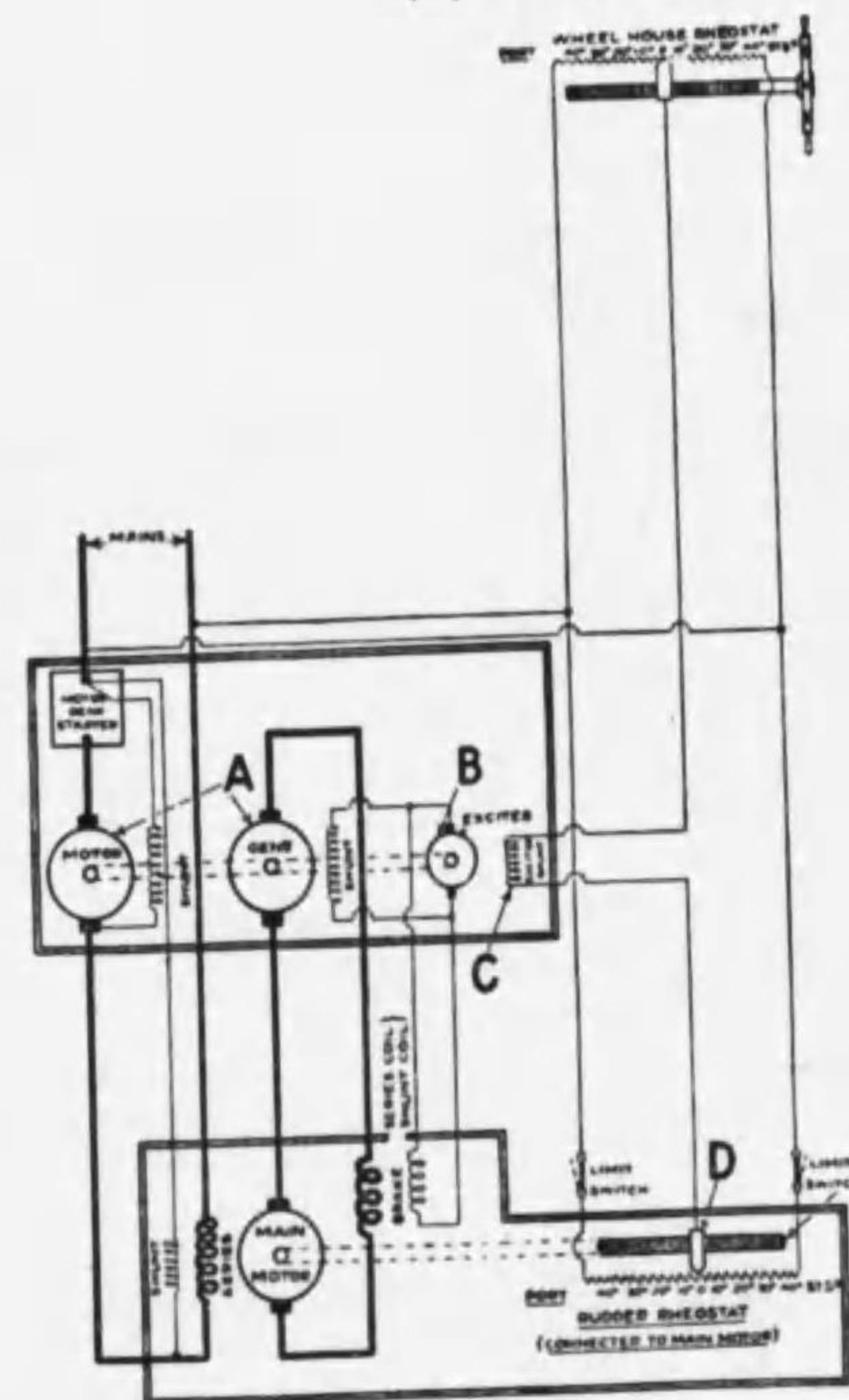
(A) General arrangement.



- A. Patent pump.
- B. Motor.
- C. Hydraulic cylinder.
- D. " ram.
- G. Rudder head.
- H. Steering wheel.
- J. Handle for friction clutch.
- K. Bye-pass valve.
- M. Safety valve.
- O. Oil tank.
- P. Pinion.

Fig. 15. Word-Leonard system electric steering gear.

(A) Simple field diagram.



- A. Motor generator.
- B. Exciter.
- C. " shunt.
- D. Contact arm.
- E. Shaft with thread.

Fig. 15. (B) Donkin-scott electric steering gear general arrangement.

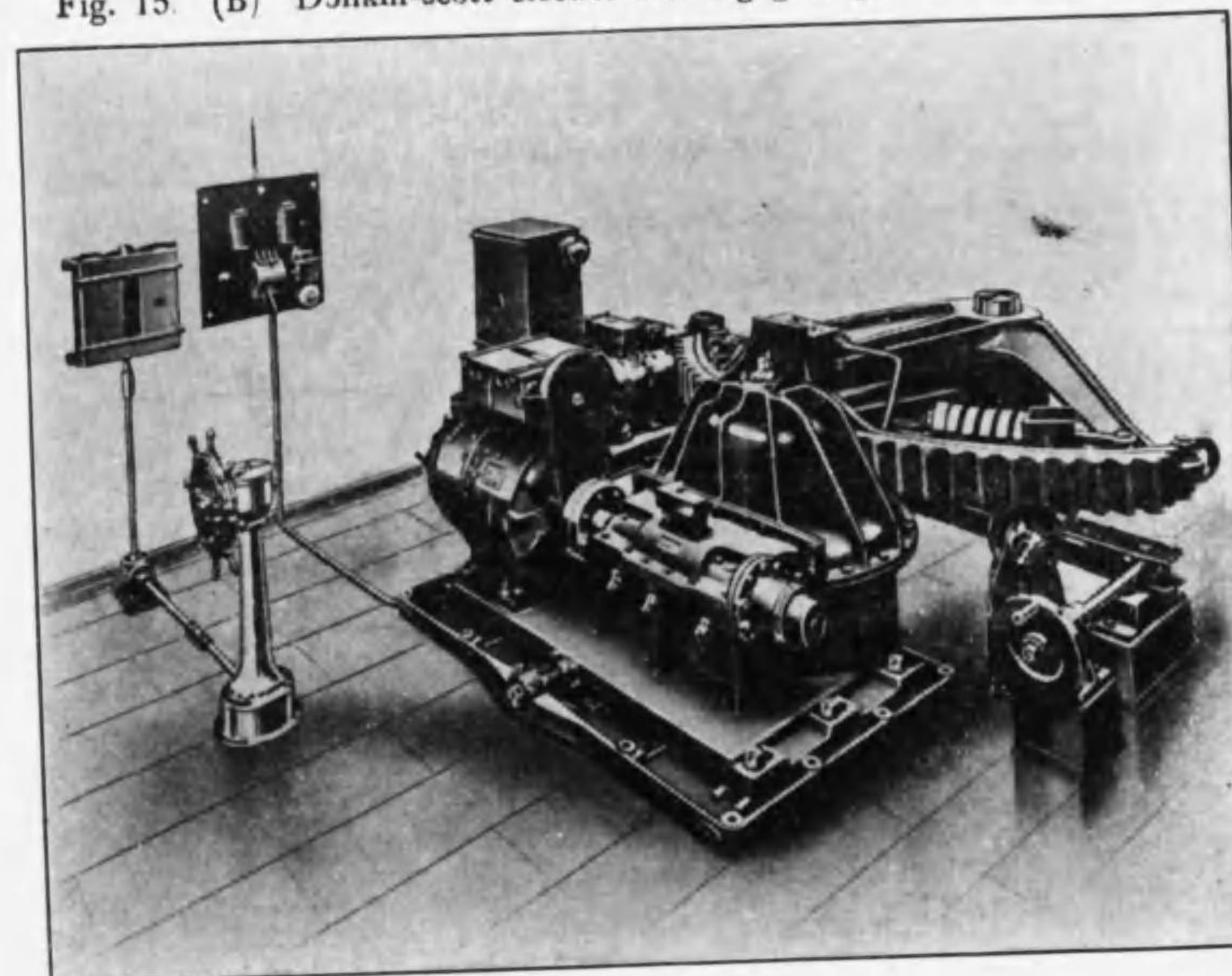
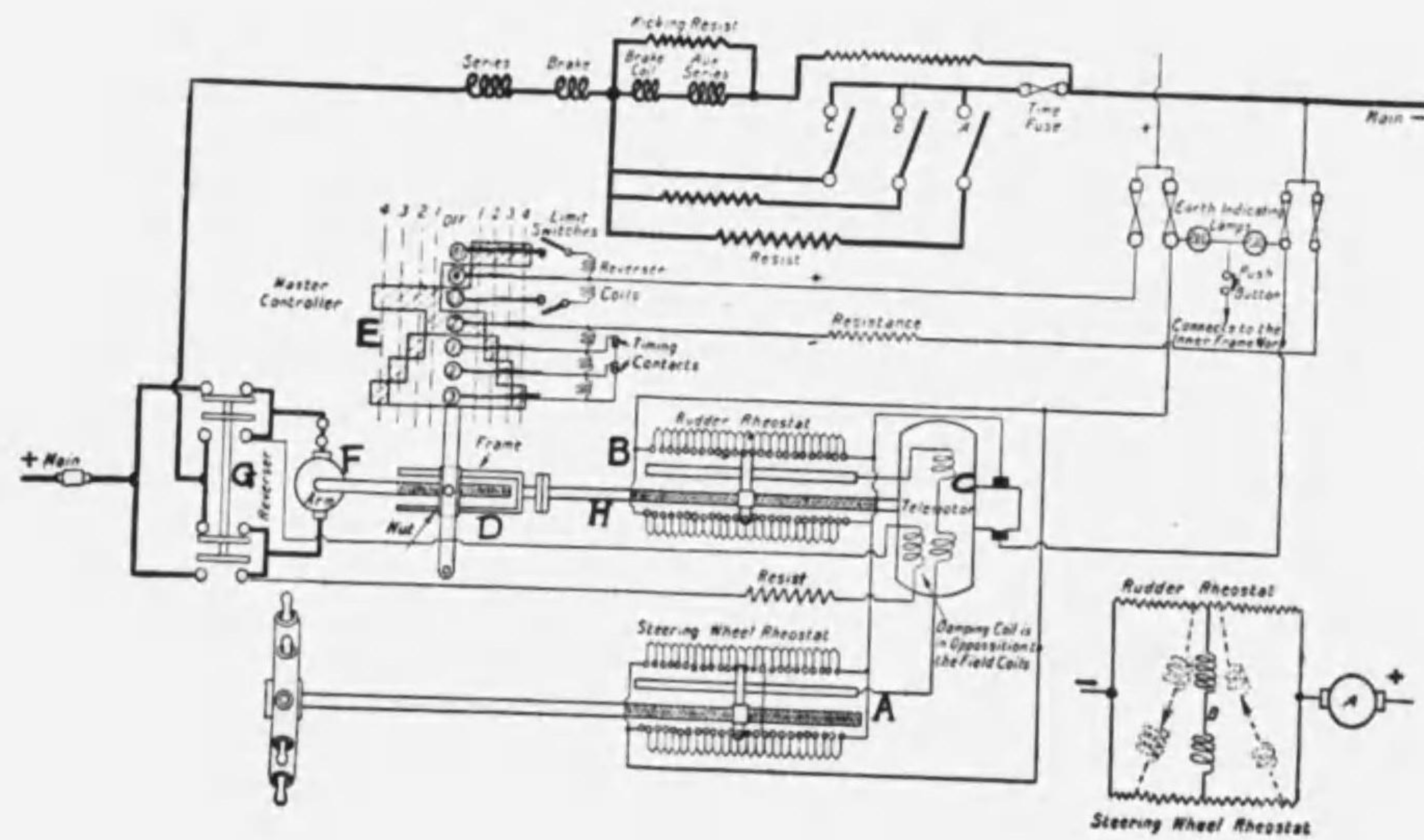




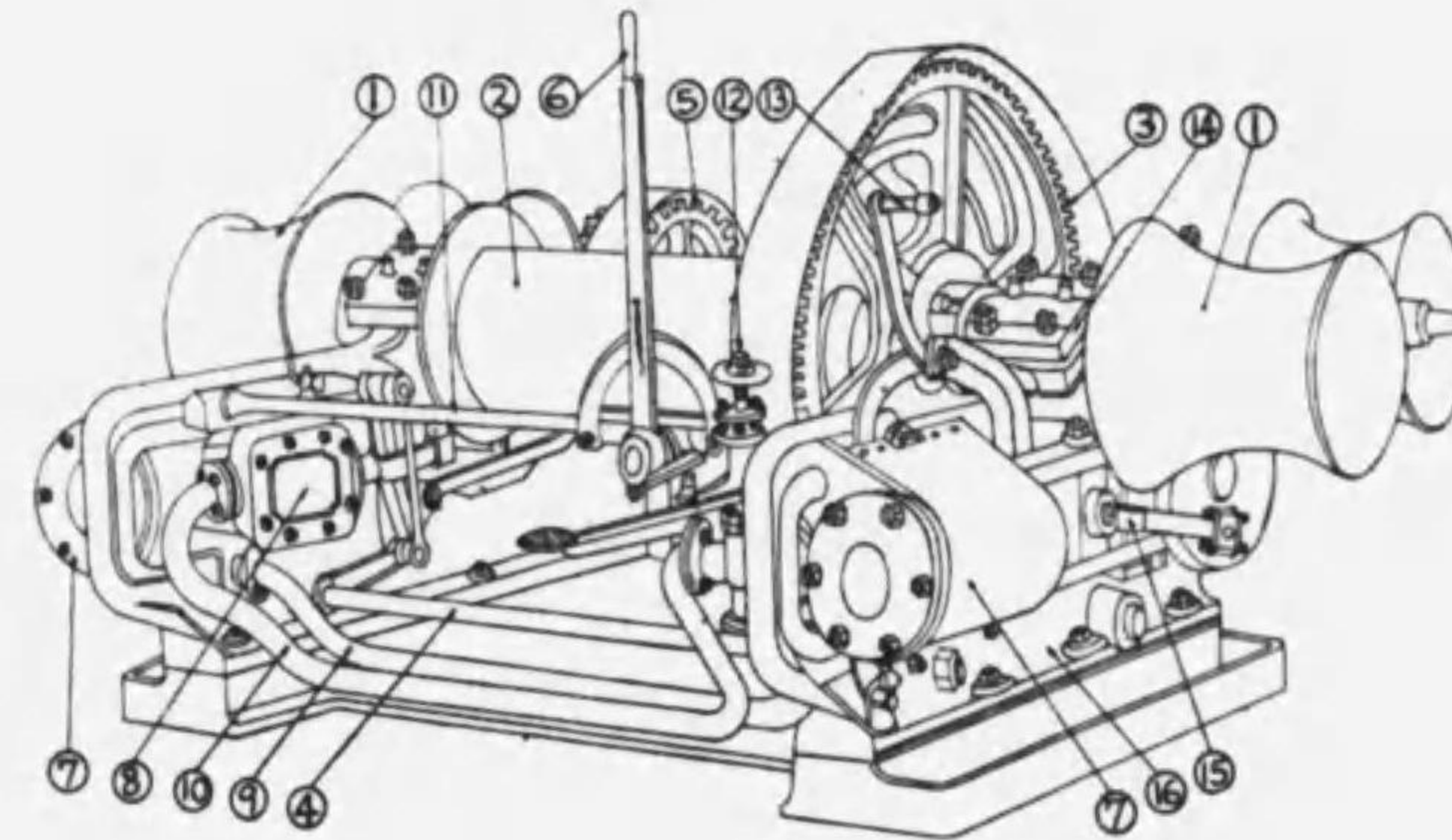
Fig. 16. Single motor system of Electric steering gear.



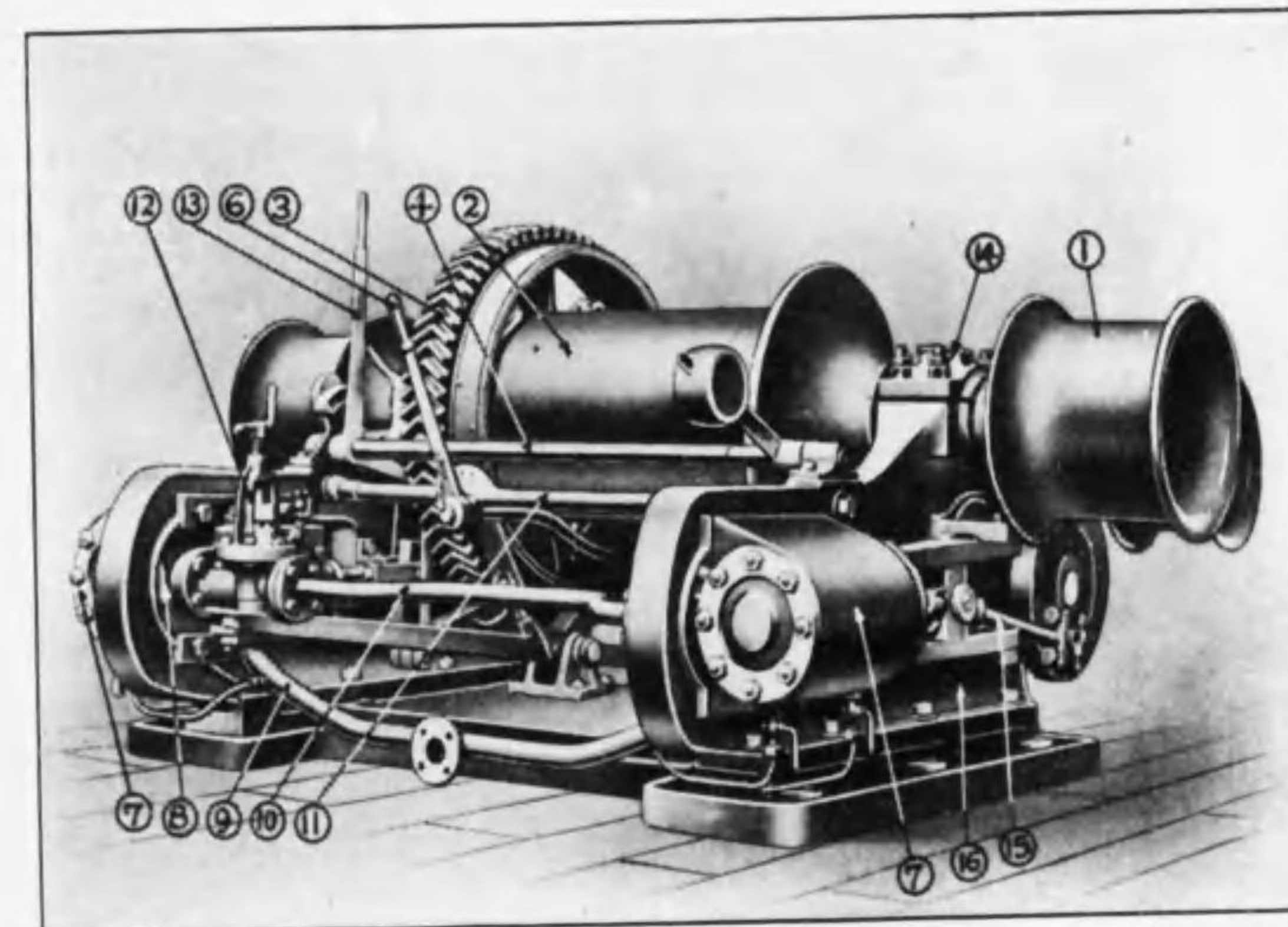
- A. Steering wheel rheostat.
- B. Rudder rheostat.
- C. Telemotor.
- D. Frame.
- E. Master controller.
- F. Motor.
- G. Reverser.
- H. Shaft with thread.

Fig. 17. Cargo winch.

(A) Steam winch.



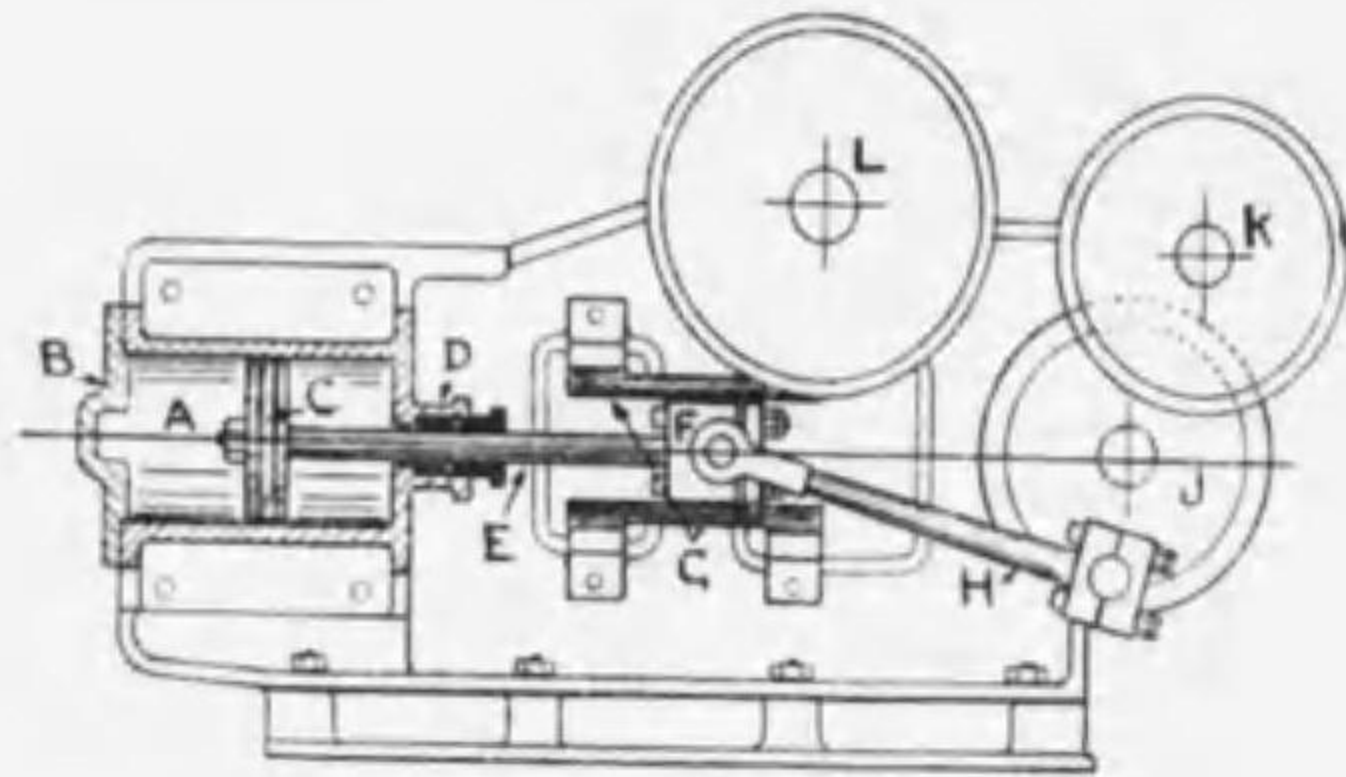
(B)



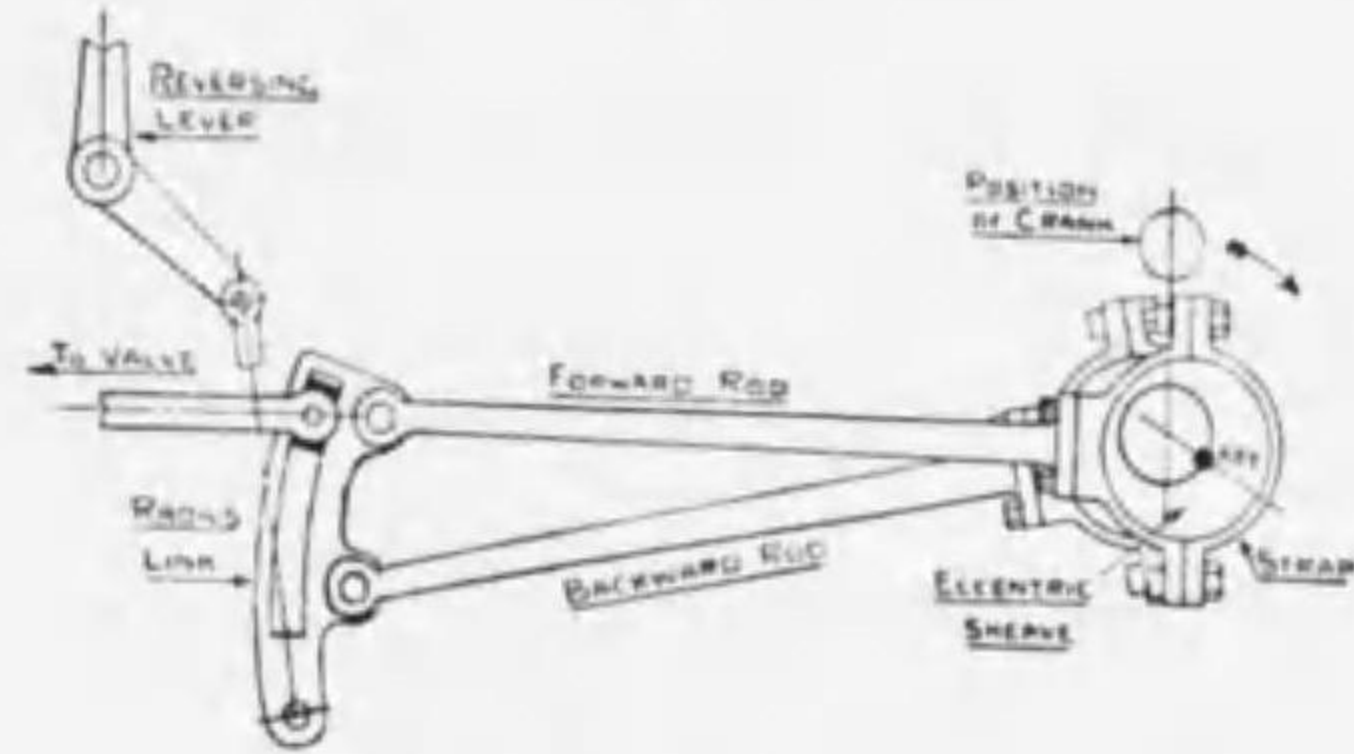
- |                      |                   |
|----------------------|-------------------|
| 1. Warping ends.     | 2. Barrel.        |
| 3. Main spur wheel.  | 4. Weigh shaft.   |
| 5. Small spur wheel. | 6. Clutch lever.  |
| 7. Cylinder.         | 8. Valve chest.   |
| 9. Exhaust pipe.     | 10. Steam pipe.   |
| 11. Tie rod.         | 12. Stop valve.   |
| 13. Reversing lever. | 14. Bearing keep. |
| 15. Connecting rod.  | 16. Bed plate.    |



Fig. 17. (C)

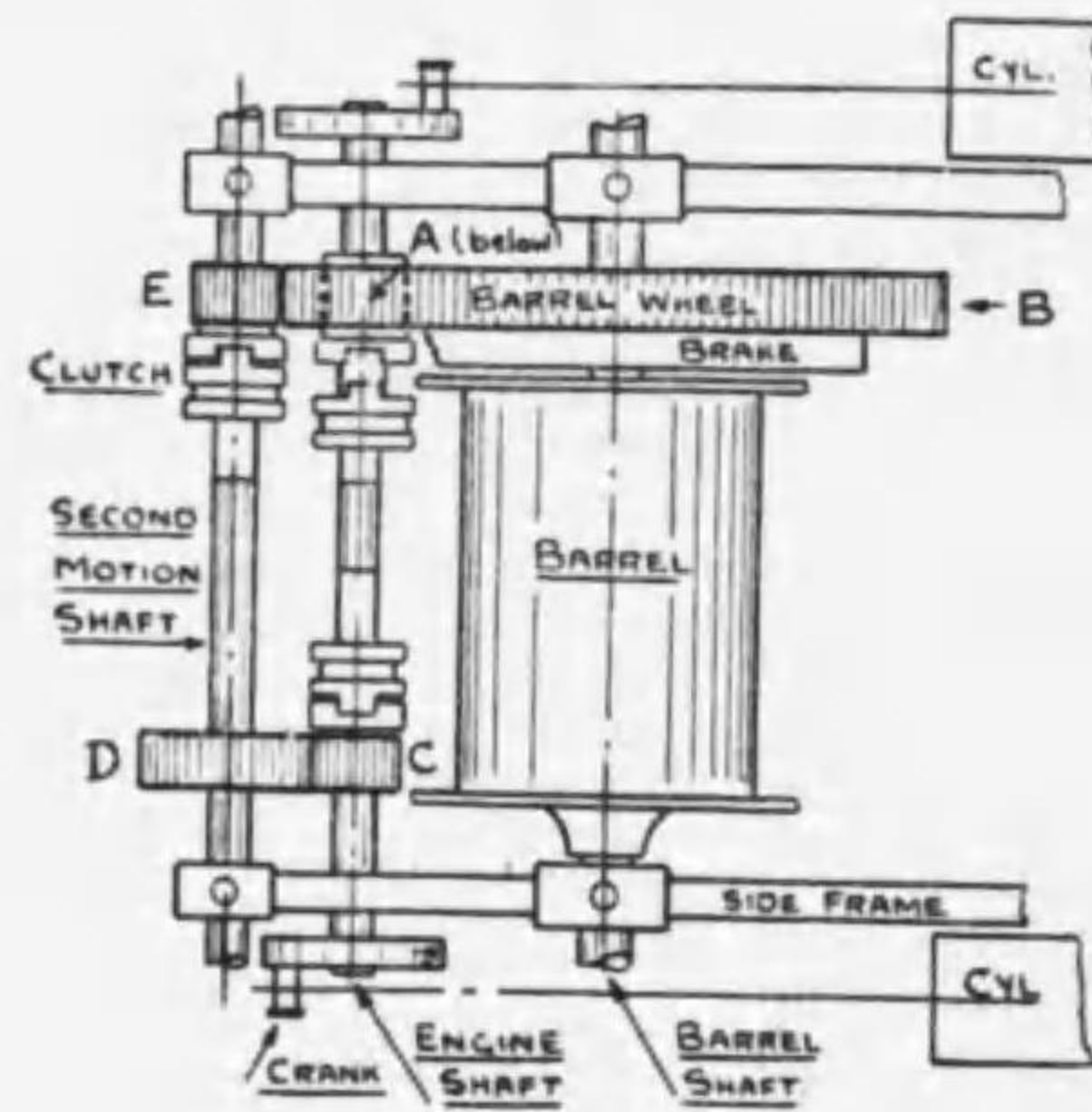


(D)



Winch reversing gear.

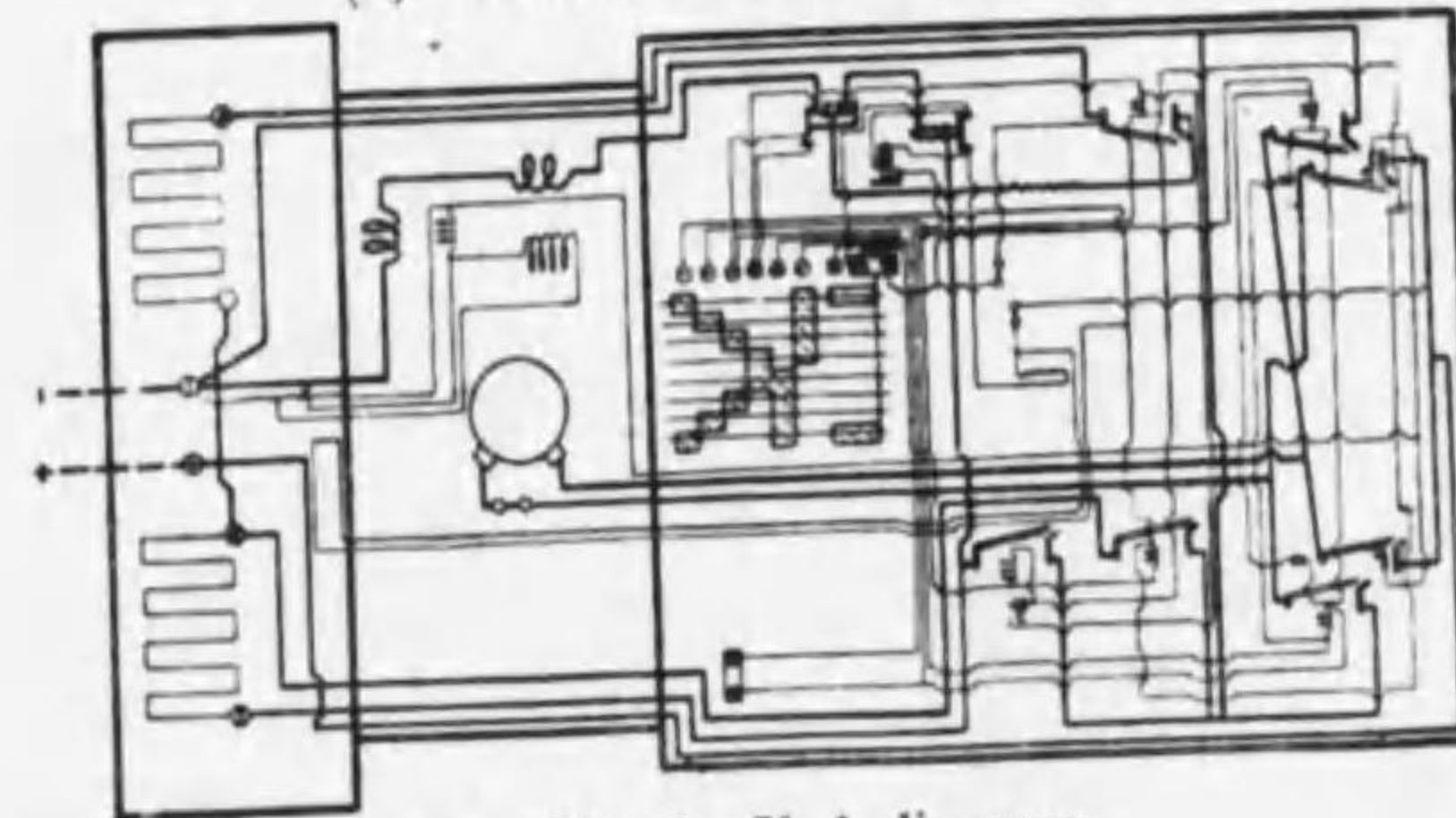
(E)



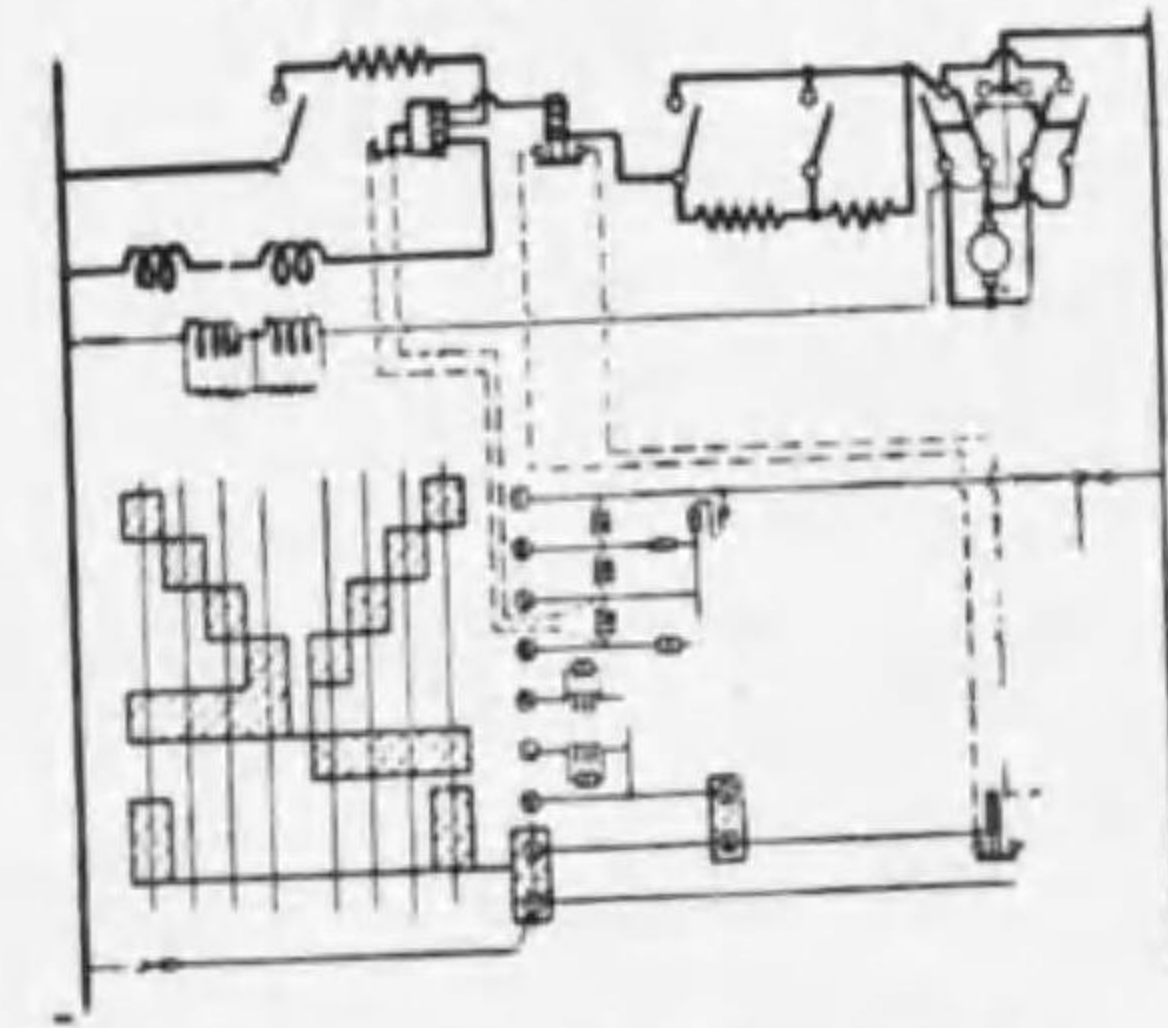
Winch Mechanism.

- A. Cylinder.
- B. Cylinder cover.
- C. Piston.
- D. Stuffing box.
- E. Piston rod.
- F. Cross head.
- G. Guides.
- H. Connecting rod.
- J. Crank disc.
- K. Whipping drum.
- L. Warping end.

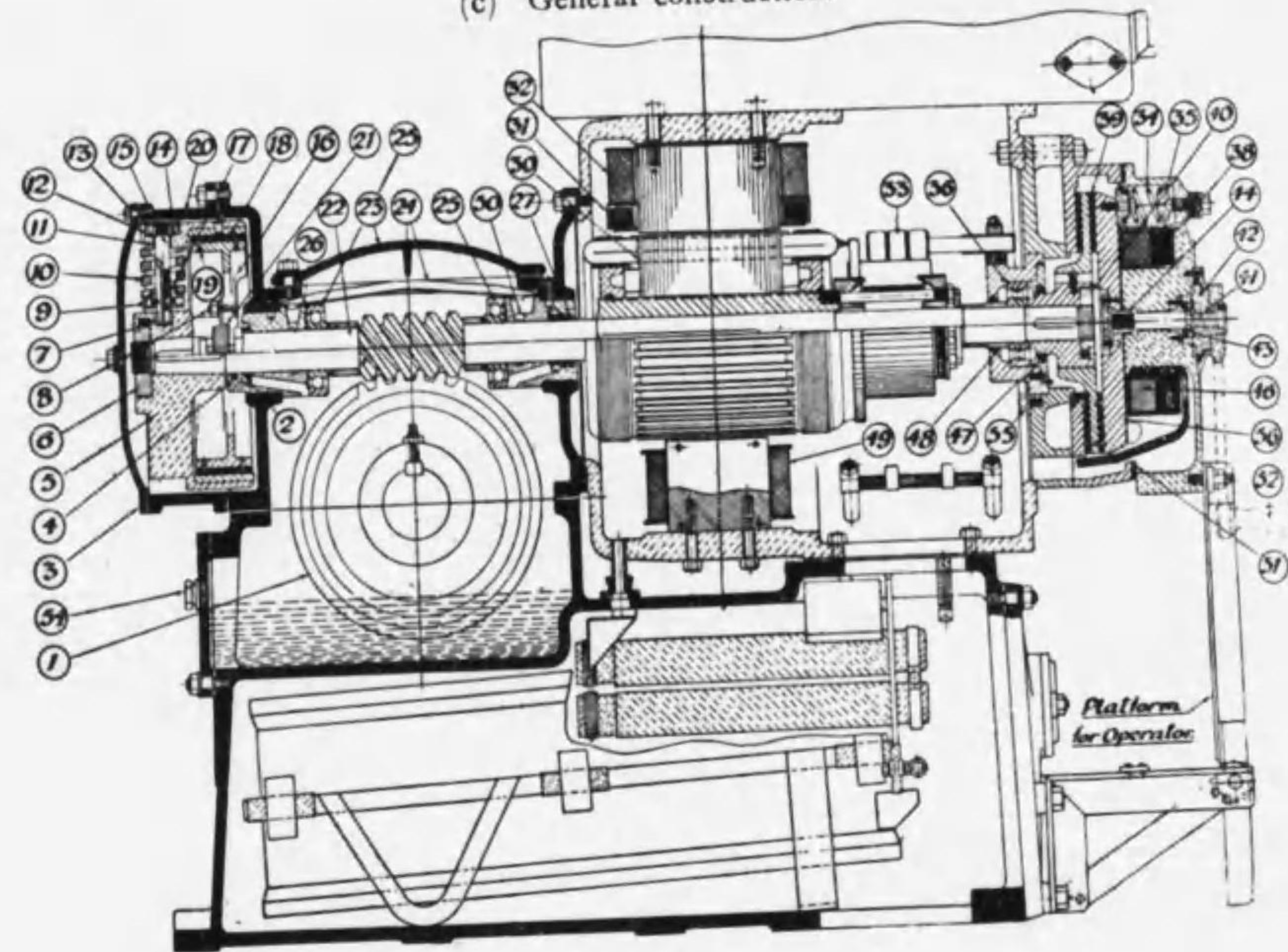
Fig. 18. Electric winch.  
(a) General wire connection.



(b) Simple filed diagram.



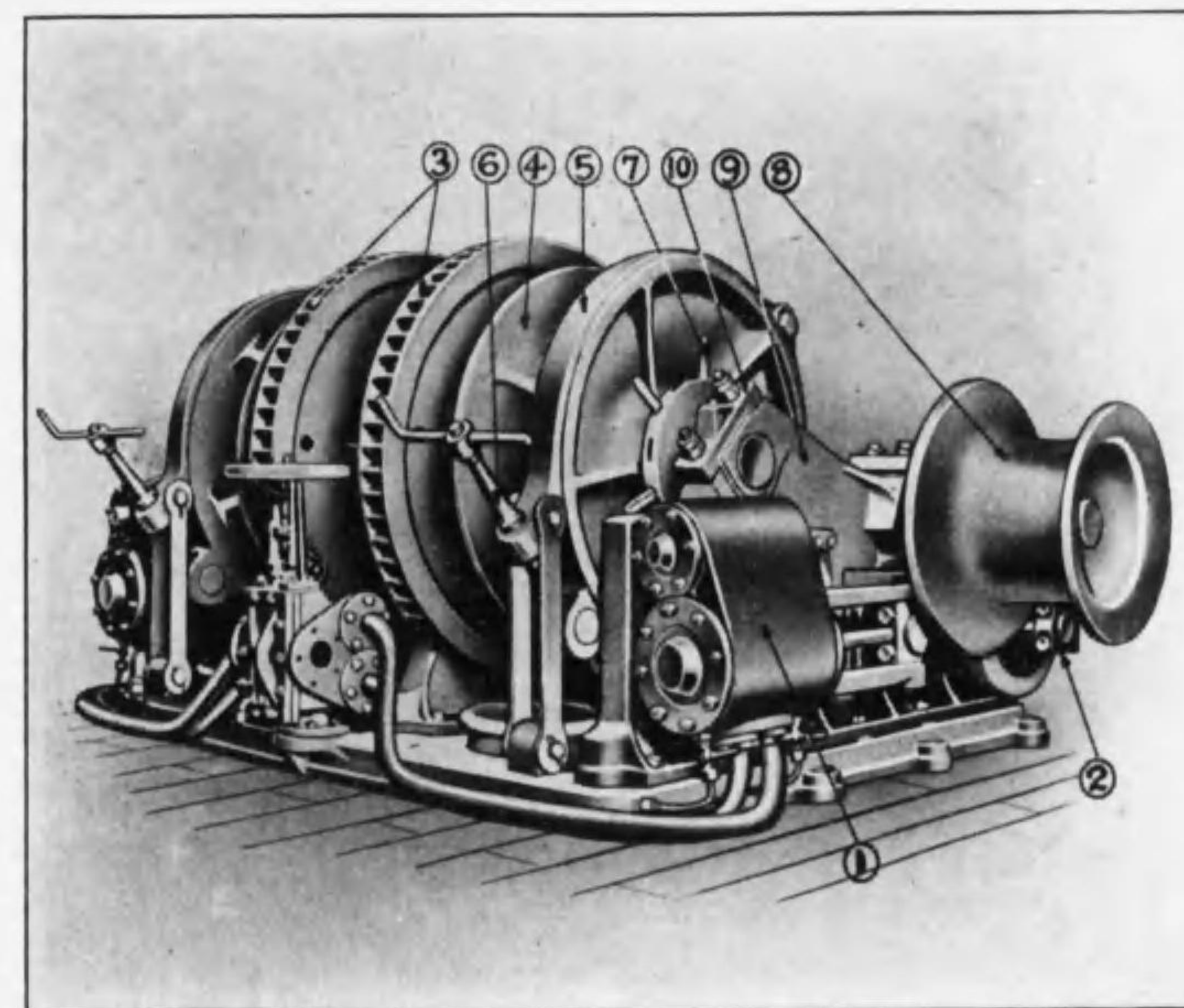
(c) General construction.





1. worm wheel.
3. Cover, centrifugal brake.
5. Centrifugal brake drum.
7. Bush, centrifugal brake shoe.
9. Locking screw, centrifugal brake nut.
11. Bush, centrifugal brake shoe.
13. Ferodo for centrifugal brake shoe.
14. Copper rivet for centrifugal brake shoe.
16. Case iron shoe for foot brake.
18. Ferodo liner for foot brake.
20. Casing for centrifugal and foot brake.
22. Worm and armature shaft.
24. Oil distributing spoon.
26. Gunmetal bearing bush, split.
30. Armature complete with commutator (less shaft)
33. Brush holder.
35. Thrust washer for ditto.
38. Shunt coil for disc brake.
40. Shaft nut.
42. Bronze nut for ditto.
44. Bronze nut for ditto.
47. Felt washer.
49. Interpole coil.
51. Shims for adjusting brake cap
54. Oil plug.
56. Armature, disc brake.
2. Oil thrower.
4. Felt washers.
6. Shaft nut.
8. Stud and nut for foot brake.
10. Spring, centrifugal brake.
12. Centrifugal brake shoe complete (less nut and spring)
15. Bronze stalk for centrifugal brake shoe.
17. Tension nut for centrifugal brake.
19. Copper rivets for ditto.
21. Tension spring for foot brake.
23. Case iron cover for worm box.
25. Double thrust ball bearing.
27. Felt washers.
31. Shunt field coil.
32. Series field coil.
34. Spring for magnetic brake.
36. Roller bearing.
39. Ferodo segments for disc brake.
41. Steel screw for hand release.
43. Ball thrust washer for ditto.
46. Series coil for disc Brake.
48. Felt washer.
50. Gunmetal bush in halves for shaft.
52. Brake release handle.
55. Clamping screw for housing.

Fig. 19. Windlass.



1. Cylinder.
2. Crank shaft.
3. Main cone driving wheel.
4. Chain grab.
5. Brake band.
6. Sprocket chain reliver.
7. Brake nut.
8. Warping end.
9. Side-bitto.



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編者 原田三郎

海軍教育振興會理事

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代表者 田中守一

兵庫縣武庫郡本庄村

神戶高等商船學校內

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