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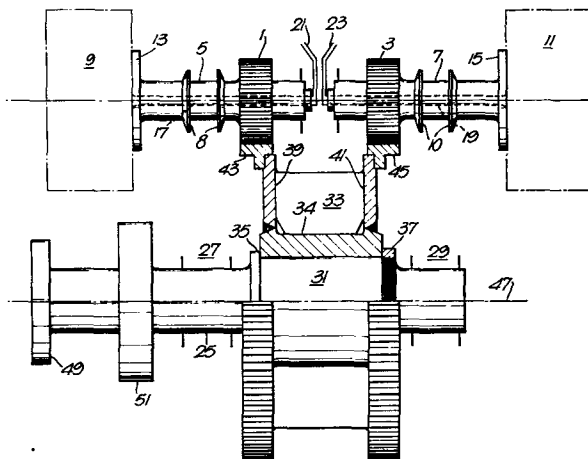
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Marine propulsion gearbox.

A twin-input single-output marine propulsion gearbox in which two input shafts are mounted independently and have respective input pinions engaging gear wheels on a common output shaft. The inner ends of the input shafts are coaxial and spaced apart to permit access to axial bores in the shafts feeding air clutches.



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Marine Propulsion Gearbox

This invention relates to marine propulsion gearboxes and is particularly concerned with such gearboxes having inputs from two engines, for example diesel engines, and a single output to a propeller.

5 According to the present invention, a twin-input single-output marine propulsion gearbox has two input pinions on separate input shafts which shafts extend coaxially in opposite directions from the gearbox, the input pinions engaging gear wheels on a common output
10 shaft. The gearwheels may be integrally mounted on a common hub. There may be included a respective air operated clutch coupled to each pinion shaft, each pinion shaft being provided with an axial duct for the passage of actuating air to the associated clutch, the axial ducts
15 having access connections in the opposed inner ends of the pinion shaft.

The gear wheels are preferably helical gears of opposite hand so as to eliminate axial thrust on the output shaft when the input pinions are driven equally.

20 One embodiment of a marine propulsion gearbox in accordance with the invention will now be described, by way of example, with reference to the accompanying drawing, which shows an elevation of the input shafting and a part section part elevation of the output shafting.

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Referring to the drawing, input pinions 1 and 3 are integrally mounted on respective pinion shafts 5 and 7 which rotate in bearings not shown. Thrust collars 8 and 10 embrace the bearings and provide axial reaction to the thrust resulting from helical gears. The pinion shafts 5 and 7 extend in opposite directions from the gearbox to respective air operated clutches 9 and 11 which are coupled to the pinion shaft flanges 13 and 15. Diesel engines not shown are coupled to the driving members of the clutches 9 and 11 and thus are mounted on opposite sides of the gear box. Each pinion shaft 5 and 7 has an axial bore 17 and 19 which extends right through the shaft and pinion and is supplied with compressed air from respective pipes 21 and 23 via access connections in the opposed inner ends of the pinion shafts. Operating air is thus supplied to the clutches through the pinion shafts. Since the axial centres of the pinion shafts are accessible at the inner ends, provision of a rotating connection between the pipes 21, 23 and the bores 17, 19 is a simple matter.

The output shaft is a single integral shaft 25 mounted on bearings (not shown) at positions 27 and 29. The output shaft has an enlarged cylindrical portion 31 on which an output gear structure 33 is mounted between a shoulder 35 and a screwed locking ring 37. The structure 33 has a hub 34 which is keyed to the shaft portion 31, and two integrally mounted radially extending gear wheel flanges 39 and 41 on which ring gears 43 and 45 are mounted respectively. These gears mesh with the pinions 1 and 3. The output gears 43 and 45 are shown in section in the drawing above the output centre line 47 and in elevation below that centre line.

The output shaft 25 is provided with a flange 49 for coupling to a marine propeller. It also has a substantial thrust collar 51 engaging a thrust bearing (not shown) against which the propeller acts.

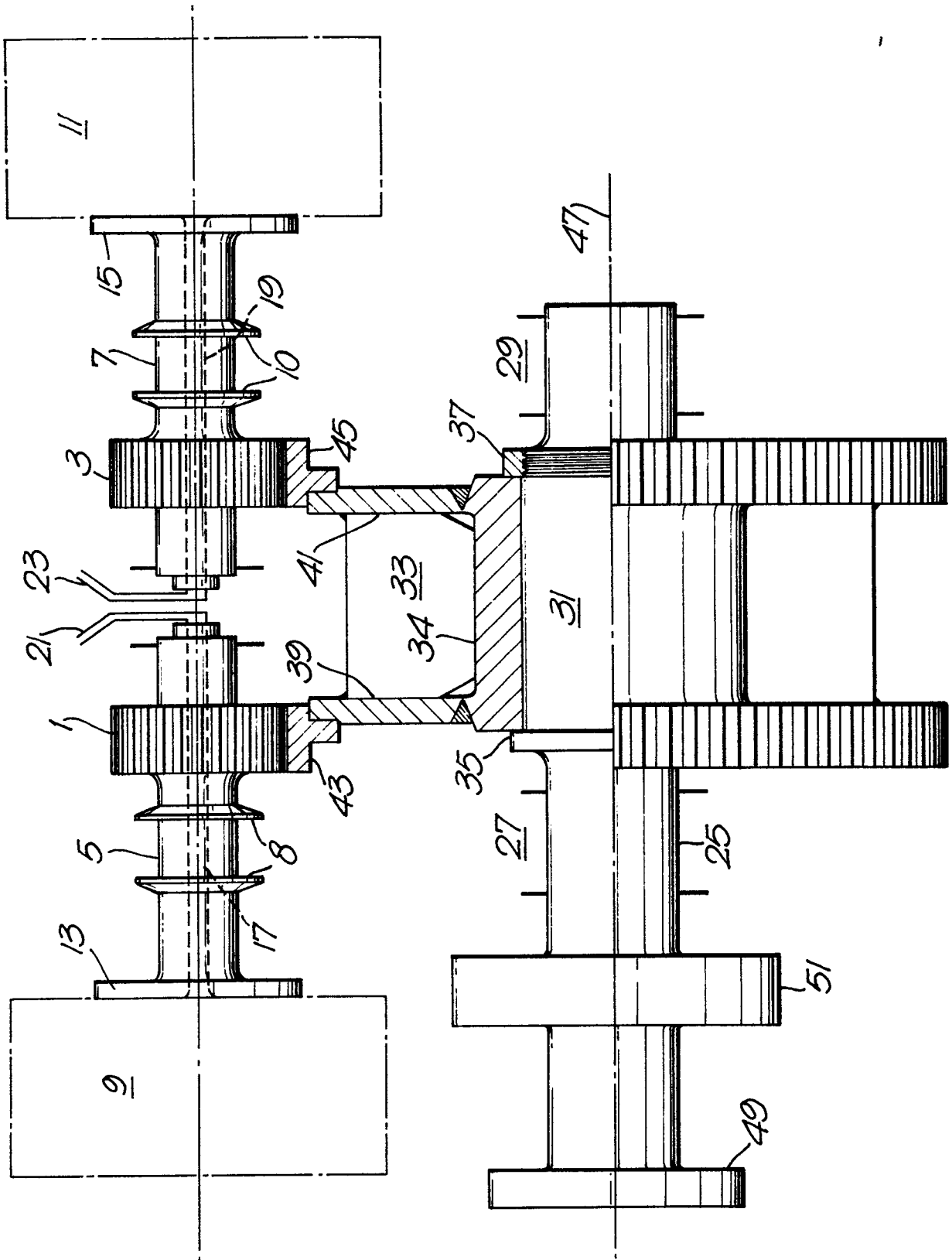
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The two pairs of reduction gears 1/43 and 3/45 have helical profiles and thus individually tend to exert axial thrust on the output shaft 25. However, the gears are of opposite hand such that the axial thrusts due to the two inputs tend to balance, and do so if the input torques are equal.

The independent and separate nature of the input shafts and pinions permits a compact coaxial input engine arrangement while still providing access to the inner ends of the shafts as described above.

CLAIMS

1. A twin-input single-output marine propulsion gearbox, characterised by two input pinions (1,3) on separate shafts (5, 7) which shafts extend coaxially in opposite directions from the gearbox, said input pinions (1, 3) engaging gear wheels (43, 45) on a common output shaft (25).
2. A gearbox according to Claim 1 characterised in that said gearwheels (43, 45) are integrally mounted on a common hub (34).
3. A gearbox according to Claim 1 or Claim 2 characterised in that a respective air operated clutch (9,11) is coupled to each pinion shaft (5, 7) and each pinion shaft (5, 7) is provided with an axial duct (11,19) for the passage of actuating air to the associated clutch (9,11), the axial ducts (17,19) having access connections (21,23) in the opposed inner ends of the pinion shaft.
4. A marine gearbox according to any preceding claim, wherein said gear wheels (43,45) are helical gears of opposite hand so as to eliminate axial thrust on the output shaft (25) when the input pinions (1,3) are driven equally.





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	GB-A-2 028 747 (G. HEIDRICH et al.) * Whole document * ---	1,2,4	B 63 H 23/10 B 63 H 23/30
X	FR-A- 781 386 (SULZER FRÈRES) * Page 2, lines 39-55; figure 5 * ---	1,2	
A	GB-A- 318 102 (G. BAUER) * Page 2, lines 6-21; figure 2 * ---	1,2,4	
A	DE-A-2 425 497 (E. SUGAHARA) * Page 11; figure 4 * -----	3	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 63 H F 16 H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 01-03-1985	Examiner BRUMER A.M.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			