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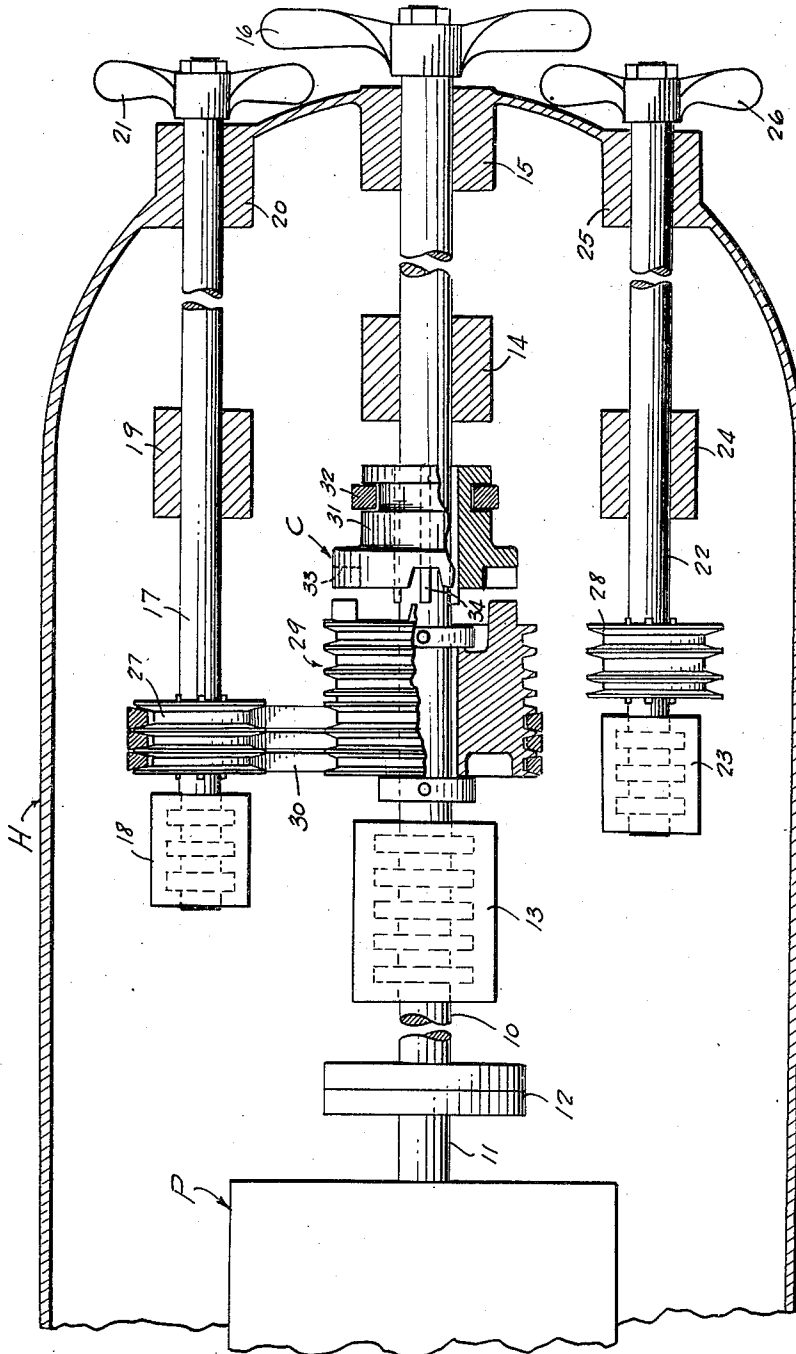
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2,371,013

MARINE DRIVE

Filed March 16, 1943

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

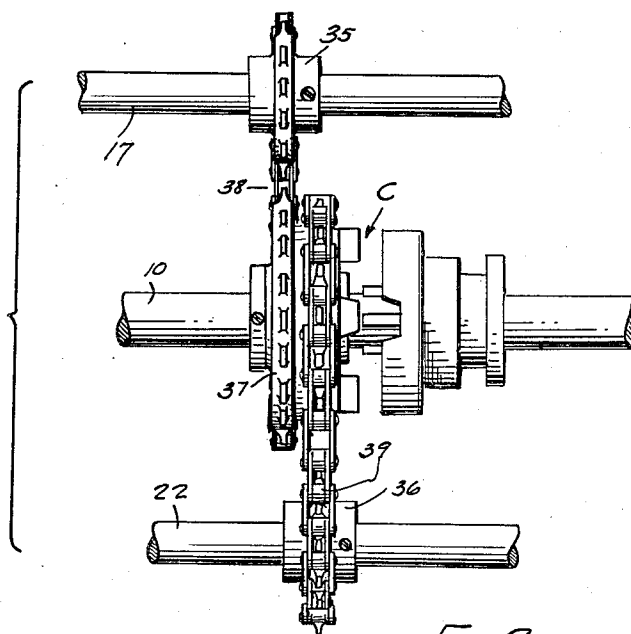


Fig. 2

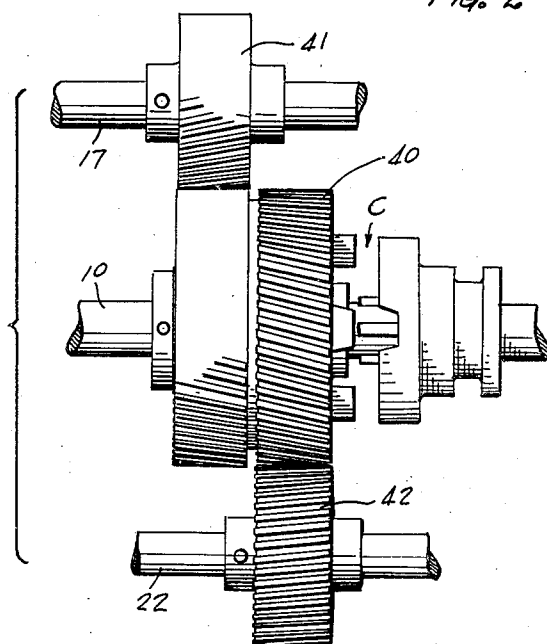


Fig. 3

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MARINE DRIVE

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5 Claims. (Cl. 115—37)

This invention relates to marine craft and it is concerned primarily with the power drive for such craft.

A marine craft of the type with which this invention is concerned, ordinarily includes a power plant. While such a power plant might consist of various multiple units, this invention recognizes the power plant as a single entity and makes provision for driving the craft at increased speeds with such a unitary power plant. When motion is first imparted to a vessel, there is a comparatively great moment of inertia which must be overcome. Due to this condition, it is necessary that initial movement of the boat take place with the maximum power which may be derived from the power plant operating on what might be called a comparatively small propeller surface. After momentum has been imparted to the boat, increased speed may be obtained by increasing the area of the propeller surface, at the same time utilizing the full power of the power plant.

With these broad ideas in mind, the invention has, as an object, the provision of a marine craft, including a power plant, and a main propeller which is connected directly to the power plant by a main drive shaft. A pair of auxiliary propellers are properly assembled with the main propeller and mounted on auxiliary drive shafts which are adapted to be driveably connected to the main drive shaft. When the craft first gets under way, the main propeller is driven directly from the power plant under maximum power, while the auxiliary propellers idle. When a proper momentum is obtained, the driving relation between the main shaft and auxiliary shafts is established to drive all the propellers under the maximum power of the power plant.

Various other more detailed objects and advantages, such as arise in carrying out the above noted thoughts in a practical embodiment, will in part become apparent, and in part be hereinafter stated as the description of the invention proceeds.

The invention, therefore, comprises a marine craft including a power plant, a main propeller connected directly to the power plant by a main drive shaft, a pair of auxiliary drive shafts with an auxiliary propeller on each auxiliary shaft, and means for establishing a driving relation between said main and auxiliary drive shafts, as occasion demands.

For a full and more complete understanding of the invention, reference may be had to the

following description and accompanying drawings, wherein:

Figure 1 is a top plan view, somewhat diagrammatic, of the rear portion of a marine craft which is designed in accordance with the precepts of this invention,

Figure 2 is an enlarged detailed showing of one modified type of mechanism which may be employed to driveably connect the main drive shaft to the auxiliary shaft, and,

Figure 3 is a similar view of another modification.

Referring now to the drawings, wherein like reference characters denote corresponding parts, and first, more particularly, to Figure 1, the hull of a marine craft is referred to in its entirety by the reference character H, and is shown as including a power plant P. Obviously, the particular shape and design of the hull is no limitation of the invention and, while, for the purposes of this specification, the power plant P is considered as a single entity, it obviously could be made up of multiple units.

A main drive shaft designated 10 is shown as connected to the driving element 11 of the power plant P by driving coupling represented at 12. This main drive shaft 10 may be mounted in any appropriate bearings that are carried by the hull H. In the drawings, these bearings are shown at 13, 14, and 15. The main drive shaft 10 projects through the hull H in the rear, and on the exterior, driveably carries a main propeller in a well-known manner. It is clearly evident that this main propeller 16 is connected directly to the power plant P through the main drive shaft 10, coupling 12, and element 11.

An auxiliary drive shaft 17 is shown as mounted in bearings 18, 19, and 20, which are carried by the hull H, as is apparent, and the auxiliary shaft 17 driveably carries an auxiliary propeller 21 which is mounted exteriorly of the hull H, as illustrated. A second auxiliary shaft 22 is mounted on the other side of the main drive shaft 10 by bearings 23, 24, and 25, which are carried by the hull H. A second auxiliary propeller 26 is driveably mounted on the shaft 22, exteriorly of the hull H.

A sheave assembly is shown at 27 as being keyed on the auxiliary shaft 17 so as to be in driving relation with respect thereto. This sheave assembly comprises a necessary number of pulley elements of V cross-sections, such as the three illustrated in the drawings. Another sheave assembly 28 is keyed to the auxiliary shaft

22 and is made up of a similar number of pulley elements.

A main sheave assembly 29 is mounted for free rotation on the main drive shaft 10. This sheave assembly 29 consists of a number of pulley elements equal to the combined total of the pulley elements in the assemblies 27 and 28. Belts 30 of V cross-sections operatively connect the sheave assembly 27 with the main sheave assembly 29, while additional belts (not shown) similarly connect the sheave assembly 28 and the main sheave assembly 29.

When the main sheave assembly 29 is free on the main drive shaft 10, the latter may be driven from the power plant P without affecting the auxiliary drive shafts 17 and 22. When occasion arises that it becomes desirable to establish the driving relation between the main drive shaft 10 and the auxiliary drive shafts 17 and 22, the clutch mechanism shown at C is employed to cause the sheave assembly 29 to rotate with the main drive shaft 10. The particular type of clutch employed for this purpose is susceptible of wide variation, as any well-known type of clutch may be employed for this purpose. In the illustrated embodiment, the collar shown at 31 is shiftable under the influence of a yoke 32 which is moved from a hand-operating lever (not illustrated). The collar 31 and the main sheave assembly 29 have parts which are adapted to interlock as illustrated at 33. Inasmuch as the collar 31 is keyed to the main drive shaft 10, as shown at 34, the establishment of the interlock at 33 causes the main sheave assembly 29 to rotate with the main drive shaft 10.

The operation of the above described mechanism which is illustrated in Figure 1, is believed to be obvious. When the boat, of which the hull H is a part, is first started, the clutch C is disconnected so that the main propeller 16 is driven directly from the power plant P, while the auxiliary propellers 21 and 26 idle. When sufficient momentum has been obtained, and increased speed is desired, the clutch C is shifted to establish the driving relation between the main drive shaft 10 and the auxiliary shafts 17 and 22. The auxiliary propellers 21 and 26 are thus brought into effect, and their additional propeller surface gives the desired increase in speed.

Referring now to Figure 2, a modified form of mechanism for driveably connecting the main drive shaft 10 to the auxiliary shafts 17 and 22, will be described. In lieu of the sheave assembly 27, the auxiliary shaft 17 carries a sprocket wheel 35 and a similar sprocket wheel 36 is keyed on the shaft 22 in lieu of the sheave assembly 28. The sprocket assembly 37 is ordinarily free on the main drive shaft 10 but may be caused to rotate therewith by the clutch mechanism shown at C. A sprocket chain 38 operatively connects the sprocket 35 with the sprocket assembly 37, while another sprocket chain 39 similarly connects the sprocket 36 and the sprocket assembly 37. While a single sprocket chain and a corresponding number of parts is shown as connecting each of the auxiliary shafts with the main drive shaft 10, it is obvious that the number of chains on each side could be increased should occasion warrant.

The clutch mechanism C may take any convenient form as above pointed out, although in the drawings it is shown as a substantial duplication of the clutch mechanism represented in Figure 1.

Figure 3 shows yet a third modification in which a main herring bone gear assembly 40 is

mounted for free rotation on the main drive shaft 10, and yet is adapted to be driveably connected therewith by the clutch mechanism C. A complementary herringbone gear 41 is keyed to the auxiliary shaft 17 and meshes with the main gear 40, while still another herringbone gear 42 is keyed on the auxiliary shaft 22 and also meshes with the main gear 40. It is obvious that when the main gear 40 is caused to rotate with the main shaft 10 by the clutch mechanism C, that the auxiliary shafts 17 and 22 will be driven.

While preferred specific embodiments of the invention are hereinbefore set forth, it is to be clearly understood that the invention is not to be limited to the exact constructions illustrated and described, because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

20 What is claimed is:

1. In a power drive for marine craft a main drive shaft; a power connection member freely rotatable on said shaft; clutch mechanism causing said power connection member to rotate with said shaft when occasion demands; a pair of auxiliary drive shafts, power connection members keyed to said auxiliary shafts; and means for operatively connecting said power connection members on said auxiliary shafts to the power connection member on said main drive shaft.

2. In a power drive for marine craft a main drive shaft; a sheave assembly freely rotatable on said shaft; clutch mechanism for causing said sheave assembly to rotate with said shaft when occasion demands; a pair of auxiliary drive shafts; a sheave assembly keyed to each of said auxiliary drive shafts; and belts driveably connecting the sheave assemblies on said auxiliary shafts with the sheave assembly on said main drive shaft.

3. In a power drive for marine craft a pair of auxiliary drive shafts; a sheave mounted on each of said auxiliary shafts in driving relation with respect thereto, each of said sheaves having a peripheral groove of V cross-section; a main drive shaft arranged substantially between said auxiliary shafts; a sheave assembly on said main drive shaft, including sheave elements corresponding in shape to those carried by said auxiliary shafts; said sheave assembly ordinarily being free on said main drive shaft; clutch mechanism for driving said sheave assembly from said main drive shaft when occasion demands; and belts of V cross-section received in said grooves of said sheaves and driveably connecting said main sheave assembly with the sheaves on said auxiliary shafts.

4. In a power drive for marine craft a pair of auxiliary drive shafts, a sprocket wheel keyed to each of said shafts; a main drive shaft, a sprocket wheel assembly mounted for free rotation on said main drive shaft; clutch mechanism adapted to be operated to driveably connect said sprocket wheel assembly and said main drive shaft; and chains driveably connecting said sprocket wheel assembly with the sprocket wheels on said auxiliary shafts.

5. In a power drive for marine craft a main drive shaft, a gear freely rotatable on said shaft; clutch mechanism adapted to establish a driving relation between said gear and said main drive shaft; a pair of auxiliary drive shafts arranged on opposite sides of said main drive shaft; and a gear keyed to each of said auxiliary shafts and meshing with said gear on the main drive shaft.

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