

(No Model.)

2 Sheets—Sheet 1.

B. L. RINEHART & B. M. TURNER.
REVERSING GEAR.

No. 567,005.

Patented Sept. 1, 1896.

fig. 1.

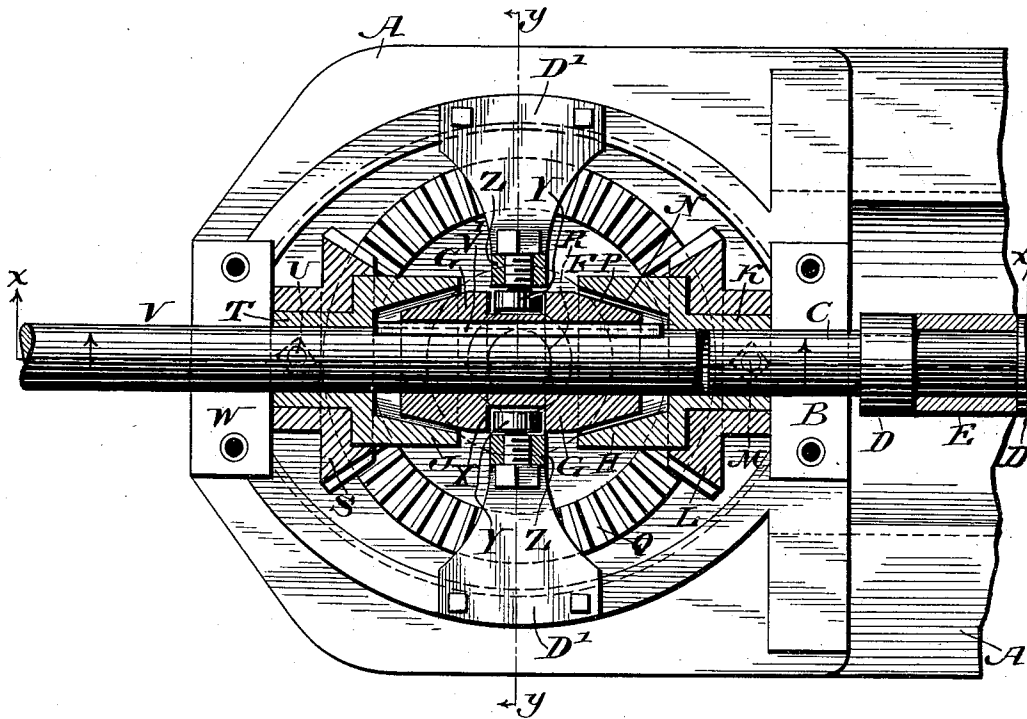
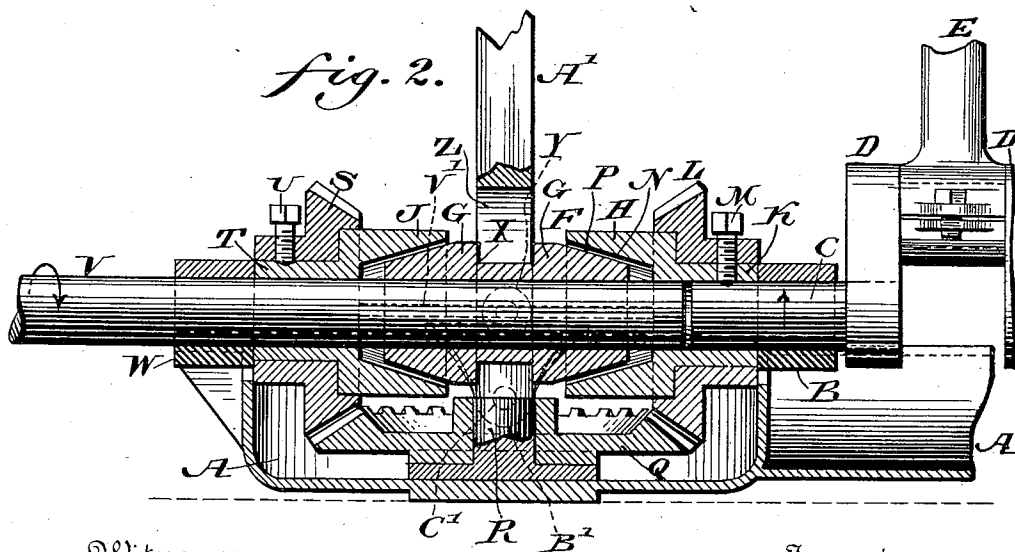


fig. 2.



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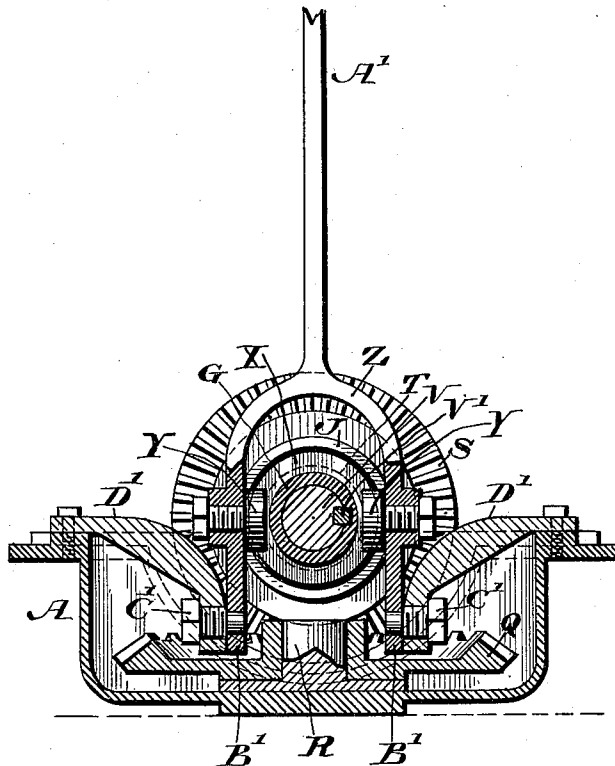
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fig. 3.



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UNITED STATES PATENT OFFICE.

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REVERSING-GEAR.

SPECIFICATION forming part of Letters Patent No. 567,005, dated September 1, 1896.

Application filed April 27, 1895. Serial No. 547,318. (No model.)

To all whom it may concern:

Be it known that we, BENTLEY L. RINEHART and BRYSON M. TURNER, citizens of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Improvement in Reversing-Gear, which improvement is fully set forth in the following specification and accompanying drawings.

Our invention consists of a novel construction of a reversing-gear, whereby the movement of a main, crank, or other shaft which continuously rotates in one and the same direction, may be imparted to an adjacent rotatable shaft, so as to cause the latter to revolve in a direction similar or opposite to the direction of rotation of said main, crank, or other shaft without necessitating the stoppage of the latter, the invention being especially applicable to propeller and other shafts, in which it is often desirable to reverse the rotation of the propeller instantly without stopping the engine.

It further consists of novel details of construction, all as will be hereinafter set forth.

Figure 1 represents a plan elevation, partly in section, of a reversing-gear embodying our invention. Fig. 2 represents a vertical sectional view of the same on line *x x*, Fig. 1. Fig. 3 represents a section on line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a supporting-casing, which is provided with the bearing B for the main shaft C, which latter has the crank D, and is caused to rotate by means of the connecting-rod E, it being understood that said shaft C always rotates in one direction.

F designates a clutch employed, the same consisting of the central member G and the end members H and J, respectively, which are substantially alike, and a description of one will therefore suffice for both. The said member H has a hub K, which is mounted on said shaft C, and on said hub is mounted the bevel-gear L, said clutch member H, gear L, and shaft C being caused to rotate in unison by means of the set-screw M or similar device. The clutch member H has its inner face N of conical shape, the largest diameter

being outside, the surface N being adapted to contact with the similarly-shaped end portion P of the member G, the same being of conical shape and having its smallest diameter at the end. The gear L meshes with a bevel-gear Q, which is mounted on the stud R, which latter is secured to the base of the casing A, the planes of rotation of said gears L and Q being at substantially a right angle to each other.

S designates a bevel-gear similar to the gear L and also in mesh with the gear Q. The said gear S is mounted on the hub T of the clutch member J, whose inner face is conical, and contacts, when desired, with the adjacent end of the member G, which is also of conical shape similar to the end P.

The gear S and the clutch member J are caused to revolve in unison by means of the set-screw U or similar device, said member J revolving freely on the secondary shaft V, which rotates in a bearing W, attached to the casing, and has one end rotatably mounted in the clutch member H, while its other end is adapted to have a propeller mounted thereon. The said shaft V is provided with a feather V', which engages the clutch member G, the latter thus being caused to rotate in unison with said shaft, but being movable longitudinally thereof, as is evident. The said member G is provided with a central groove X, the walls of which are engaged by the rollers Y, which are suitably journaled in the yoke Z at the lower end of the lever A', the ends B' of said yoke being suitably fulcrumed on the studs or pins C', which are secured near the ends of the arms or plates D', which are attached to each side of the casing A, as will be understood from Figs. 1 and 3.

The operation is as follows: When the parts are in the positions seen in Figs. 1 and 2 and the main shaft C is rotating, the gear L and the clutch member H will be rotated, and also the gears Q and S and the member J, as will be evident. When the central member G is in the position seen in Figs. 1 and 2, the shaft V will not be rotated, since the member J revolves freely thereon. If the lever A' be moved so as to cause the adjacent portions of the members G and H to contact, the shafts V and C will revolve in the same direction

by reason of the frictional contact between said members, as is evident. If the lever A' be moved so as to cause the adjacent portions of the members J and G to contact, the shaft
 5 V will be caused to rotate in a direction opposite to said shaft C, as will be readily understood by following the directions of rotation of the gears L, Q, and S, a movement of the lever A' thus changing the direction of rota-
 10 tion of the shaft V without necessitating the stopping of the rotation of the shaft C.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

15 1. In a reversing-gear, a main shaft, a secondary shaft in longitudinal continuity therewith, suitable bearings for said shafts, a clutch consisting of end members, and an intermediate member, one end member being
 20 fast to the main shaft, and having one end of the secondary shaft rotatably mounted therein, the other end member being loose on the secondary shaft, bevel-gears mounted on said end members, so as to revolve in unison
 25 therewith, a bevel-gear suitably supported and in mesh with the former gears, said intermediate member being splined to said secondary shaft, and having conical ends adapted to contact with the inner surfaces of conical
 30 sockets in said end member, and means for actuating said intermediate member longitudinally of its shaft, substantially as described.

35 2. In a reversing-gear, a supporting-casing, a main shaft having a bearing in said casing, a secondary shaft in longitudinal continuity with said main shaft, a clutch consisting of end members, and an intermediate member, one of said end members being mounted on
 40 said main shaft and serving as a bearing for one end of the secondary shaft, the other end

of the latter having its bearings in said casing, the other end member being rotatably mounted on said secondary shaft, bevel-gears mounted on said end members and adapted
 45 to rotate therewith, and a bevel-gear rotatably mounted on a stud supported in the lower portion of said casing, and in mesh with the former gears, said intermediate member being splined to said secondary shaft, and having
 50 conical ends adapted to contact with the inner surface of conical sockets in said end members, in combination with a yoke which is adapted to engage and operate said intermediate clutch member, and is fulcrumed ad-
 55 jacent said shafts, substantially as described.

3. In a reversing-gear, a supporting-casing having a main shaft C mounted therein, the hollow clutch member H having a hub K mounted on said shaft, a bevel-gear L mounted
 60 on said hub, so that said main shaft, clutch member and gear revolve in unison, the secondary shaft V having its bearings in said casing and member H, the hollow clutch member J mounted on the secondary shaft and
 65 having the bevel-gear S secured to its hub, said member J being rotatable independent of its supporting-shaft, the intermediate gear-wheel Q supported within the casing and meshing with the gears L and S, said inter-
 70 mediate member G being splined to said shaft V, and adapted to engage either of said members H or J, or to be free from both, and a lever adapted to shift said member G longitudinally upon its supporting-shaft V, sub-
 75 stantially as described.

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