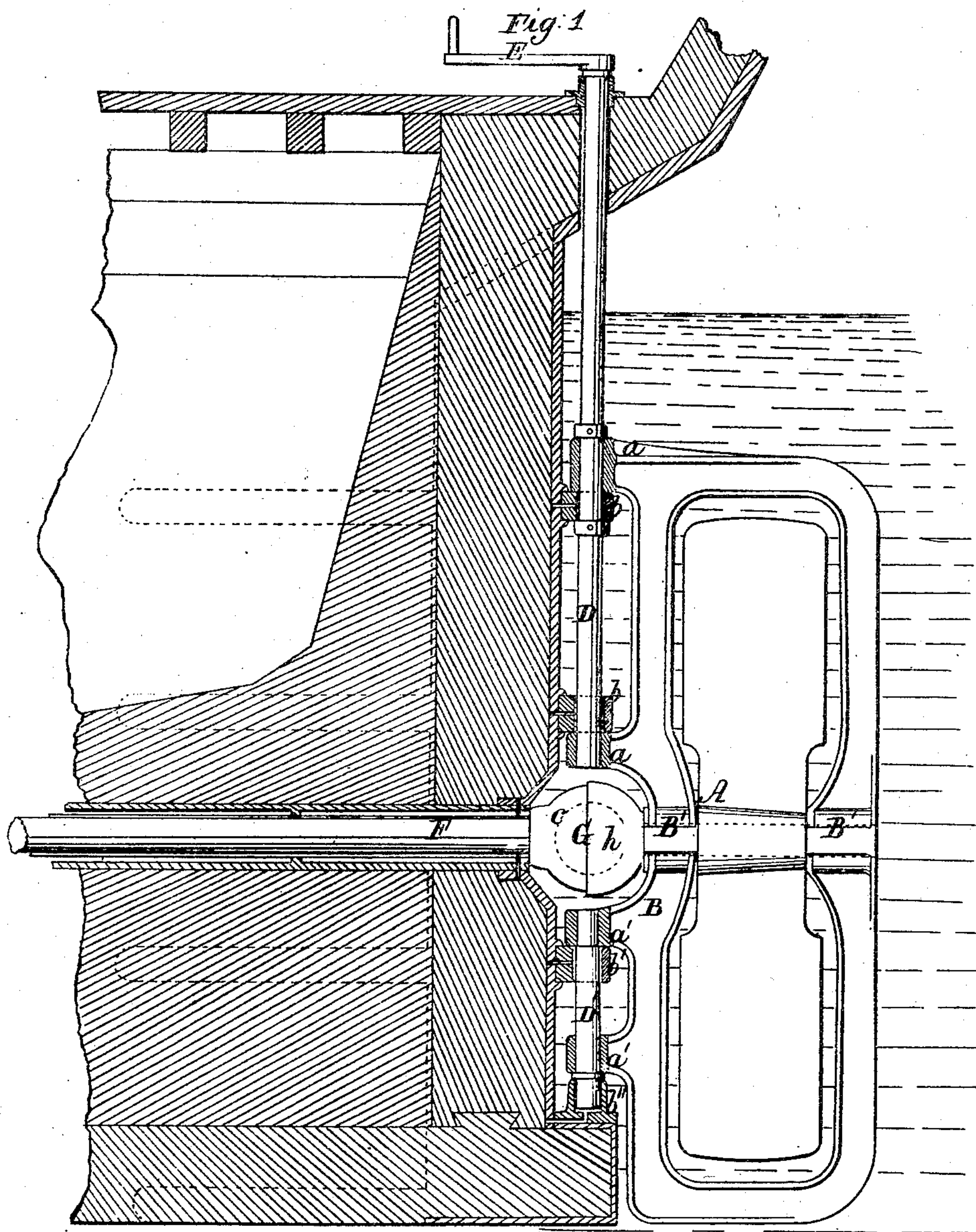


H. Ressel.
Screw Propeller.

N^o 44, 696.

Patented Oct. 11, 1864



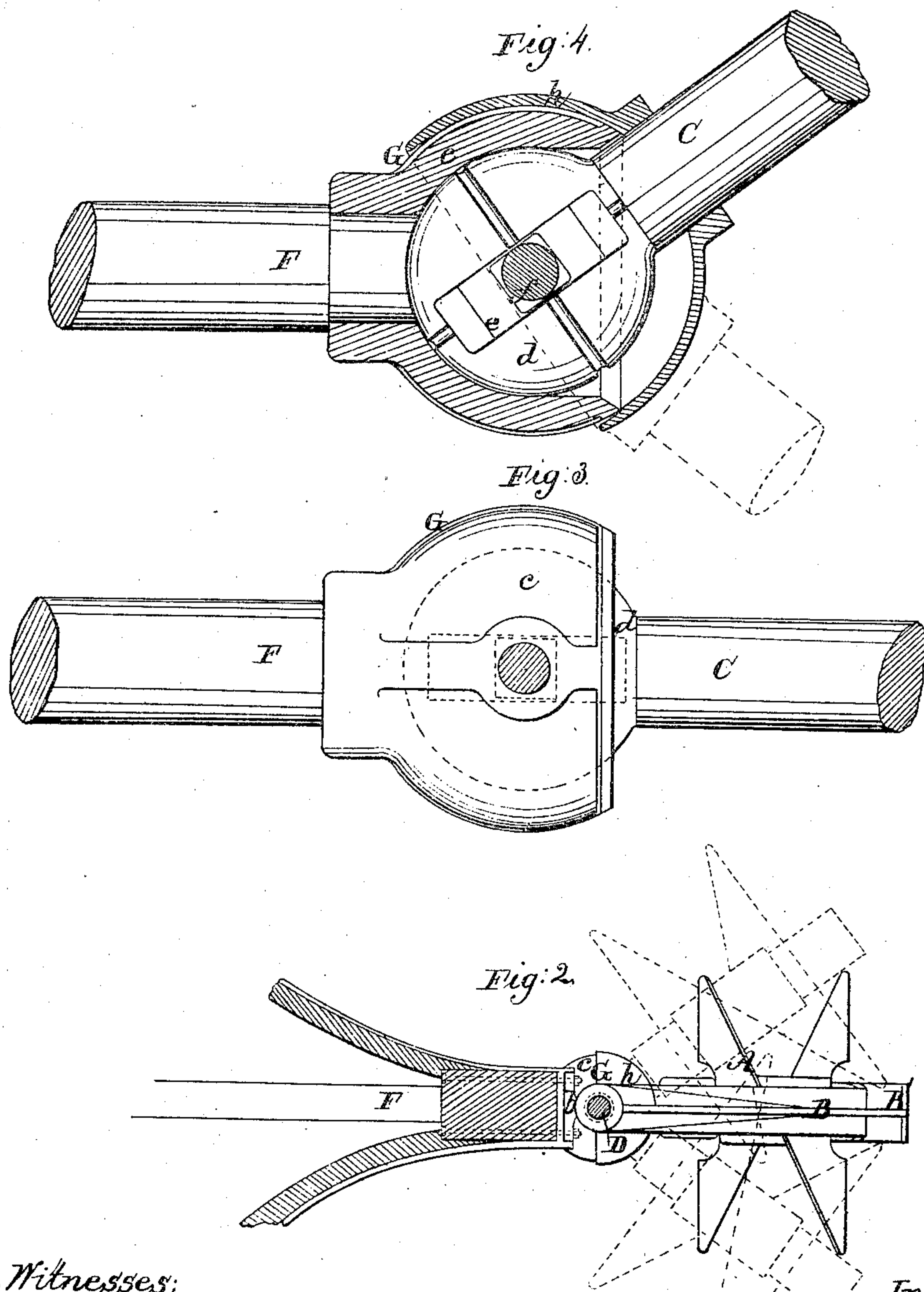
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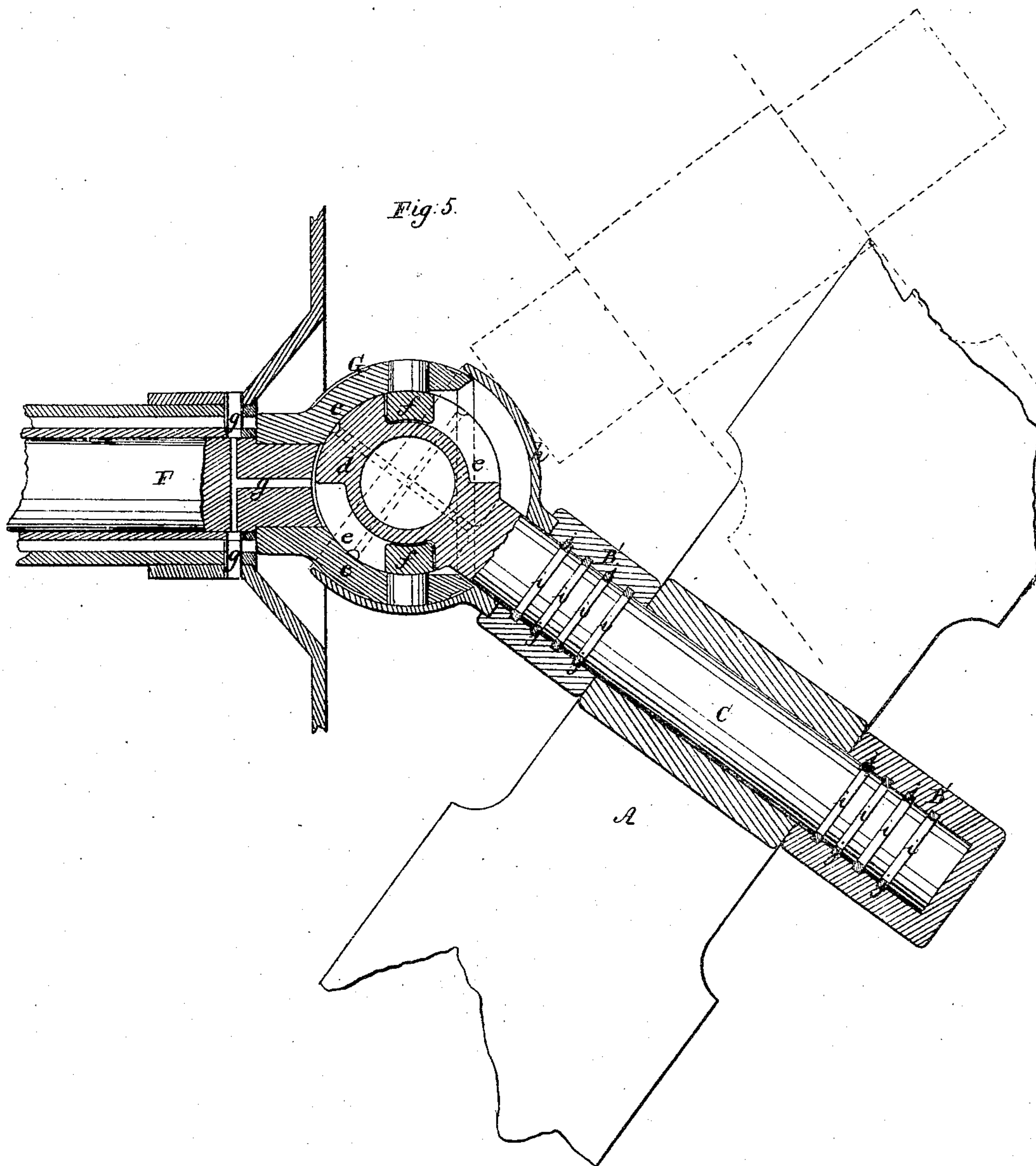
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UNITED STATES PATENT OFFICE.

HENRY RESSEL, OF VIENNA, AUSTRIA.

IMPROVED PROPELLER AND STEERING APPARATUS.

Specification forming part of Letters Patent No. 44,696, dated October 11, 1864.

To all whom it may concern:

Be it known that I, HENRY RESSEL, of Vienna, in the Empire of Austria, have invented a new and Improved Combined Propeller and Steering Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation of my invention. Fig. 2 is a horizontal section of the same. Figs. 3, 4, and 5 are different views of the ball-and-socket joint connecting the main driving-shaft with the propeller-shaft in a larger scale than the previous figures.

Similar letters of reference indicate like parts.

The object of this invention is to render the use of a propeller as a steering apparatus practicable on vessels of any kind and size, and particularly on war-vessels.

Heretofore it has been considered impracticable to use a propeller as a steering apparatus on sea-going vessels, and the attempts made to effect this purpose have been confined to small vessels running on inland waters, particularly on account of the great difficulty to produce a strong and durable joint between the main driving-shaft and the propeller-shaft.

The joint which forms the subject-matter of this present invention is composed of a socket attached to the main driving-shaft and provided with two or more studs, which project in segmental grooves in the ball or globe attached to the propeller-shaft in such a manner that the propeller can be moved to an angle of thirty-seven degrees (more or less) to either side of its normal position without interfering with its connection with the main driving-shaft, and that it can be rotated when in an angular position with comparatively little friction. The globe is protected by a hemispherical cap and semicircular rings placed in circular grooves cut in the journals and journal-boxes of the propeller-shaft, which relieve the studs in the ball-and-socket joint from all strain in the direction of the shafts.

The propeller-screw A is secured to a shaft, C, which has its bearings in a frame, B, provided for this purpose with suitable boxes, B'. This frame is hung on two strong wrought-

iron shafts, D D', which take the place of the rudder-post in ordinary vessels. These shafts are firmly secured in lugs *a a'*, projecting from the inner edge of the frame B, and the lower shaft, D', is stepped in a box, *b''*, below, and its upper end has a bearing in a box, *b'*, secured to the stern-post of the vessel. These boxes ought to be made of or lined with starr metal, or of any other suitable composition of sufficient strength and tenacity and capable to withstand the influence of the sea-water.

The upper shaft, D, has its bearings in boxes *b*, secured to the stern-post of the vessel, and it extends up into the interior of the vessel, where it connects by suitable gear-wheels with the steering-wheel, so that by taking hold of that wheel the shaft D and frame B, together with the propeller, can be turned in either direction.

In the drawings, a simple tiller, E, is represented in place of the steering-wheel, but it is obvious that, particularly for large vessels, the tiller would be insufficient for the purpose.

The propeller-shaft C connects with the main driving-shaft F by a ball-and-socket joint, G, which is of peculiar construction, as will be presently explained.

To the end of the main driving-shaft F a hemispherical socket *c* is firmly keyed, and this socket receives the globe *d*, that is rigidly attached to the inner end of the propeller-shaft C. This globe is provided with two segmental grooves, *e*, running in the direction of the shaft C, and two studs, *f*, which project from the inner surface of the socket *c*, catch in these grooves and compel the globe *d* and shaft C to rotate with the main driving-shaft F. The studs *f* fit nicely into the grooves *e*, and said grooves are of such a length that the frame B, with the propeller, will swing over an arc of about seventy-four degrees, more or less—viz., thirty-seven degrees to either side of its normal position. In whatever position it may be brought the studs *f* will compel it to rotate with the main driving-shaft, and the friction created by the joint will be comparatively small provided the same is kept well oiled and protected from dirt. The oil or lubricating material is introduced through a channel, *g*, in the end of the main driving-shaft F, (see Fig. 5 of the drawings,) and this channel may be brought in communication with a suitable pump for the

purpose of injecting the lubricating material at proper intervals.

A hemispherical cap, *h*, keyed to the propeller-shaft C, and extending over the socket *c*, (as clearly shown in Fig. 5 of the drawings,) protects the joint against impurities floating in the water, and also serves to confine the lubricating material within the joint.

In order to save the joint, and particularly the studs, from all strain in the direction of the propeller-shaft, the journals of said shaft and the boxes B' in the frame B are provided with circular grooves to receive semi-circular rings *j*, which will intercept all strain caused by the action of the propeller or by the force of the sea in the direction of the shaft C. The ball-and-socket joint is thus protected from all strain except that necessary to transmit the motion from the main driving shaft to the propeller-shaft, and a strong, firm, and durable joint is obtained which works with the least possible friction.

By this joint and the manner of connecting the frame B to the vessel the use of the propeller for the purpose of steering is rendered practicable, and it is confidently expected

that by its use a vessel of the largest size, armor-plated or not, can be made to turn on its own center, which will be of the greatest advantage, particularly for vessels of war.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is--

1. The studs *f* and segmental grooves *e*, applied in combination with the socket *c* and globe *d*, and with the shafts C and F, in the manner and for the purpose substantially as set forth.

2. The use of the cap *h* in combination with the ball-and-socket joint G and shafts C and F, applied and operating substantially as and for the purpose described.

3. The grooves *i* and rings *j*, applied in combination with the ball-and-socket joint G, propeller-screw A, shafts C and F, and frame B, in the manner and for the purpose substantially as set forth.

Vienna, on this 26th day of July, 1864.

HENRY RESSEL.

Testificators:

CARL VON HÜGEL,
CERVO REGGIO.