(No Model.)

J. PHILP.

THRUST BLOCK.

No. 601,103. Patented Mar. 22, 1898.

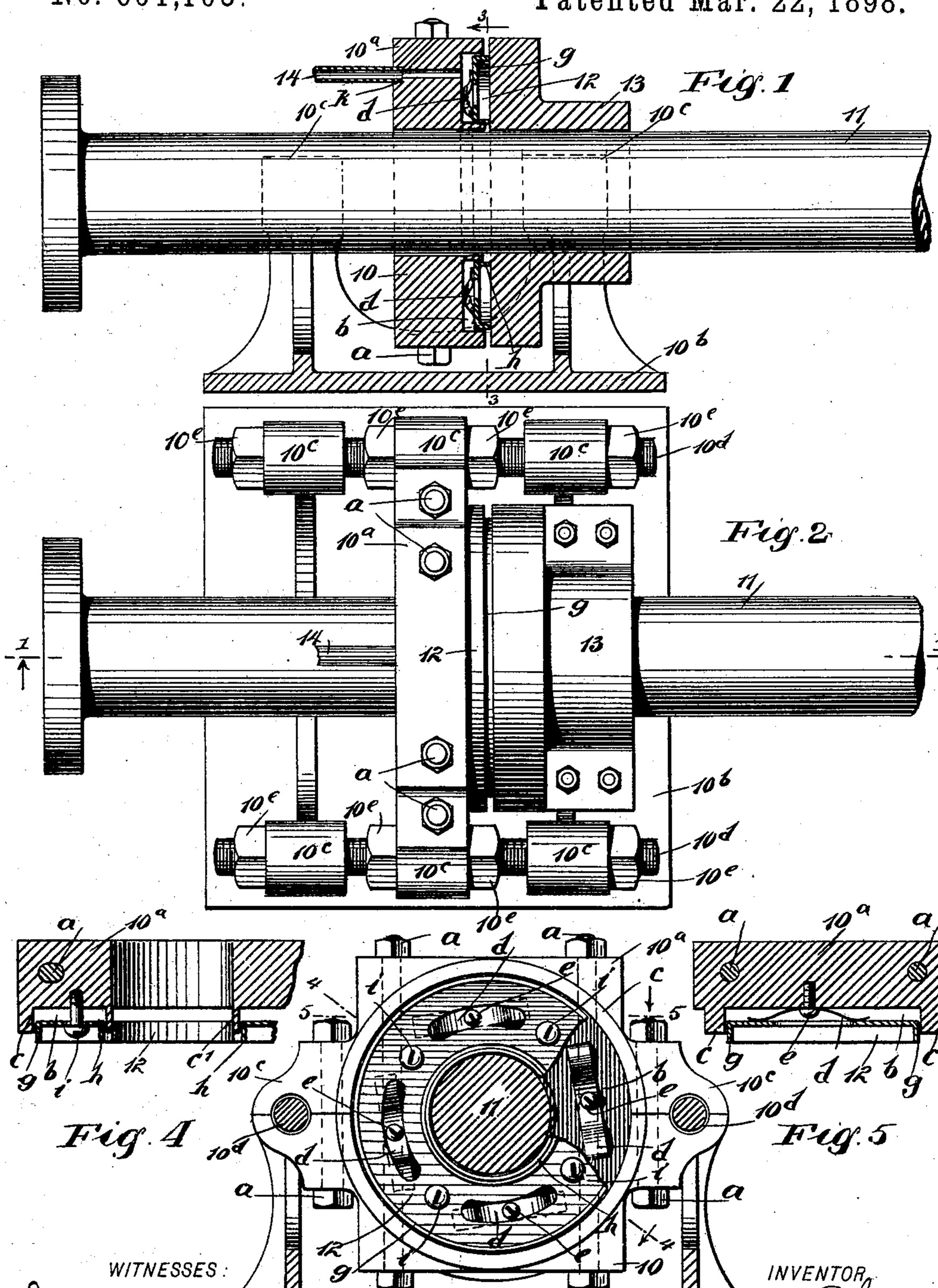

Fig. 1

Fig. 2

Fig. 4

Fig. 5

Fig. 3

WITNESSES:

John A. Bergstrom

Wm. L. Patton

INVENTOR,

J. Philp.

BY

Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN PHILP, OF NEW YORK, N. Y.

THRUST-BLOCK.

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Application filed August 18, 1897. Serial No. 648,664. (No model.)

To all whom it may concern:

Be it known that I, JOHN PHILP, of New York city, in the county and State of New York, have invented a new and Improved Thrust-Block for Propeller-Shafts, of which the following is a full, clear, and exact description.

This invention relates to bearings between the stationary and running portions of supports for a propeller-shaft, and which sustain the end thrust of such a shaft in service.

It is well known that the ordinary thrust-block for the shaft of a marine propeller is subjected to excessive frictional resistance between the contacting surfaces of the same, so that considerable power is wasted in overcoming such impediment to rotative motion.

The object of my invention is to provide simple and effective means whereby the friction between the running parts of a thrust-bearing for a propeller-shaft will be greatly reduced and thus effect a large gain in the effective force applied for the rotation of the shaft.

The invention consists in the novel construction and combination of parts, as is hereinafter described, and defined in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of a thrust-block having the improvement taken substantially on the line 1 1 in Fig. 2. Fig. 2 is a plan view of the same. Fig. 3 is a transverse sectional view substantially on the line 3 3 in Fig. 1. Fig. 4 is a longitudinal sectional view essentially on the diagonal line 4 4 in Fig. 3, and Fig. 5 is a sectional plan view on the line 5 5 in Fig. 3.

In the drawings which illustrate the application of the invention, 10 indicates the stationary body portion of a thrust-block which affords a bearing for the rotatable propeller-shaft 11, and 10^a is the cap portion of said block, removably held thereon by the screw-bolts *a*. The stationary body of the thrust-block and its cap are held in position upon a base-plate 10^b by laterally-projecting bosses 10^c, which are fixed projections from the base-plate and are furnished with the longitudinally-adjustable screw-bolts 10^d, having nuts 10^e thereon, which afford means to lock the block-body 10 upon the base-plate 10^b at any desired point, and as this is a common provision for the indicated purpose further description of the same is not deemed necessary.

A recess *b* is formed in the side of the body 10 and cap 10^a, which in service is nearest to the propeller (not shown) and which faces toward the right in the drawings or toward the broken end of the shaft 11, which latter in complete form is extended through the stern of the vessel.

In the recess *b* an inner circular collar-flange *c'* projects from the bottom of said recess concentric with the outer wall *c* thereof, as is indicated in Figs. 3 and 4, the inner surface of the flange *c'* conforming with the bore of the block wherein the shaft 11 is received.

The provision of the collar-flanges *c c'* renders the recess *b* annular, and at spaced intervals on the bottom of the annular recess a suitable number of preferably elliptic plate-springs *d* are secured by central screws *e*, so that the free ends of the springs will project outwardly, as shown in Fig. 5, where one of said springs appears.

An annular sealing-plate 12 is fitted to slide liquid-tight in the recess *b*, and the outer face of said plate is recessed, so as to produce two concentric flanges *g h* that form, respectively, the outer and inner circular walls of the sealing-plate.

Suitably-shaped apertures are produced in the bottom wall of the plate 12 to expose the heads of the screws *e*, and between these spaced apertures screw-holes are formed in the bottom of the sealing-plate. Through the said holes screws or bolts *i* are screwed into tapped holes formed for their reception in the bottom of the recess *b*, whereby the sealing-plate is secured in place upon the springs *d*. The screws *i* are so adjusted that the springs *d* will be afforded sufficient resilience for efficient action.

On the propeller-shaft 11 a contact-block 13 is secured, preferably as shown, said running portion of the thrust-block device being formed of two half-sections bolted together and clamped upon the shaft.

In service the block 13 is held in contact with the sealing-plate 12, that has the free

edges of the flanges *g h* thereon normally projected a short distance outside of the recess *b* by the springs *d* to permit said edges to impinge upon the flat face of the block 13.

A supply-pipe 14 is secured in a perforation *k*, formed in the stationary-block body 10, as shown in Fig. 1, this perforation and pipe being provided for the introduction of oil or other suitable liquid into the recess *b*.

The pipe 14 is to be extended to an oil-forcing pump (not shown) which is to be operated as occasion may require, and thus keep up a suitable pressure of the liquid within the stationary block 10.

In operation the end thrust of the propeller which presses the running block 13 against the sealing-plate 12 will be cushioned by the pressure of oil that passes through said plate and contacts with the flat face of the running block. Any slight escape of the liquid that acts as a cushion on the running block from the joints between the edges of the collar-flanges *g h* and the running block 13 may be caught in a drip-pan (not shown) and supplied to the pump for reuse.

It will be seen that the liquid-bearing established between the stationary and running portions of the improved thrust-block will obviate friction in a large degree, and thus save power consumed in ordinary thrust-blocks for propeller-shafts by excessive frictional resistance had therein to rotary motion of the propeller-shaft.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a thrust-block for shafts, a stationary-block body having an annular recess on one side thereof, a shaft rotating in the stationary block, a circular-edged running block secured on the shaft having a flat side opposite the annular recess of the stationary block, a perforated sealing-plate in the annular recess adapted to contact with its edge upon the running block, and means to introduce a liquid-cushion within the annular recess and also through the sealing-plate so as to contact with the flat face of the running block, substantially as described.

2. In a thrust-block for a propeller-shaft, the combination with a rotatable shaft, a stationary-thrust-block body recessed in one side and supporting the shaft, and a running block having a flat side and secured upon the shaft adjacent to the recessed side of the stationary block, of an annular sealing-plate having two concentric collar-flanges at the edges thereof, and spaced apertures in its flat body, elliptic plate-springs secured in the recess and pressing the sealing-plate outwardly in said recess, and an oil-supplying device adapted to force oil into the recess, as specified.

JOHN PHILP.

Witnesses:
T. DONALD TOD,
E. B. MARSHALL.