

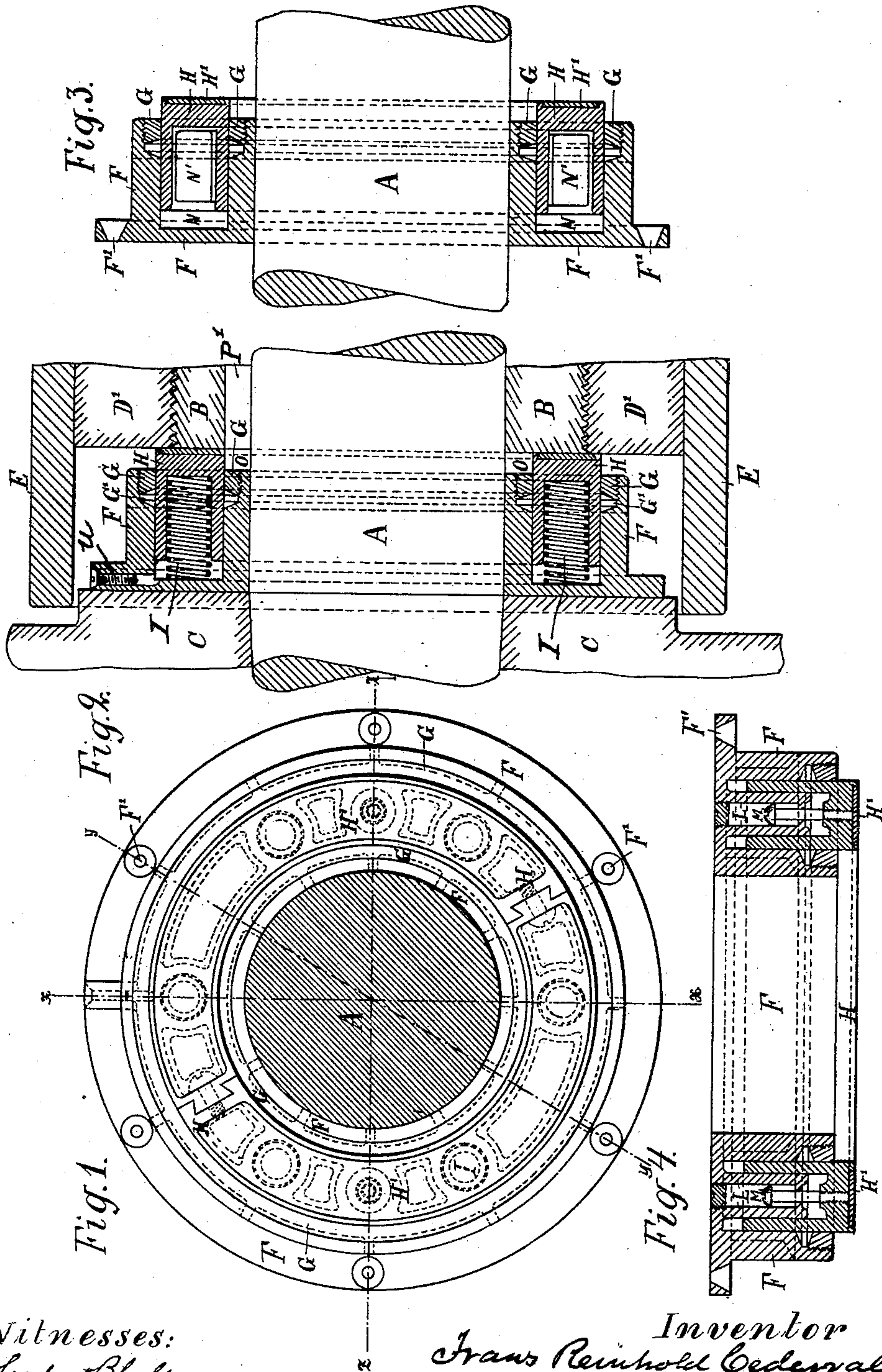
(No Model.)

F. R. CEDERVALL.
LUBRICATOR FOR PROPELLER SHAFTS.

2 Sheets—Sheet 1.

No. 475,436.

Patented May 24, 1892.



Witnesses:
Herbert Blossom
Charles H. Walsh

Inventor
Franz Reinhold Cedervall
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Attorney

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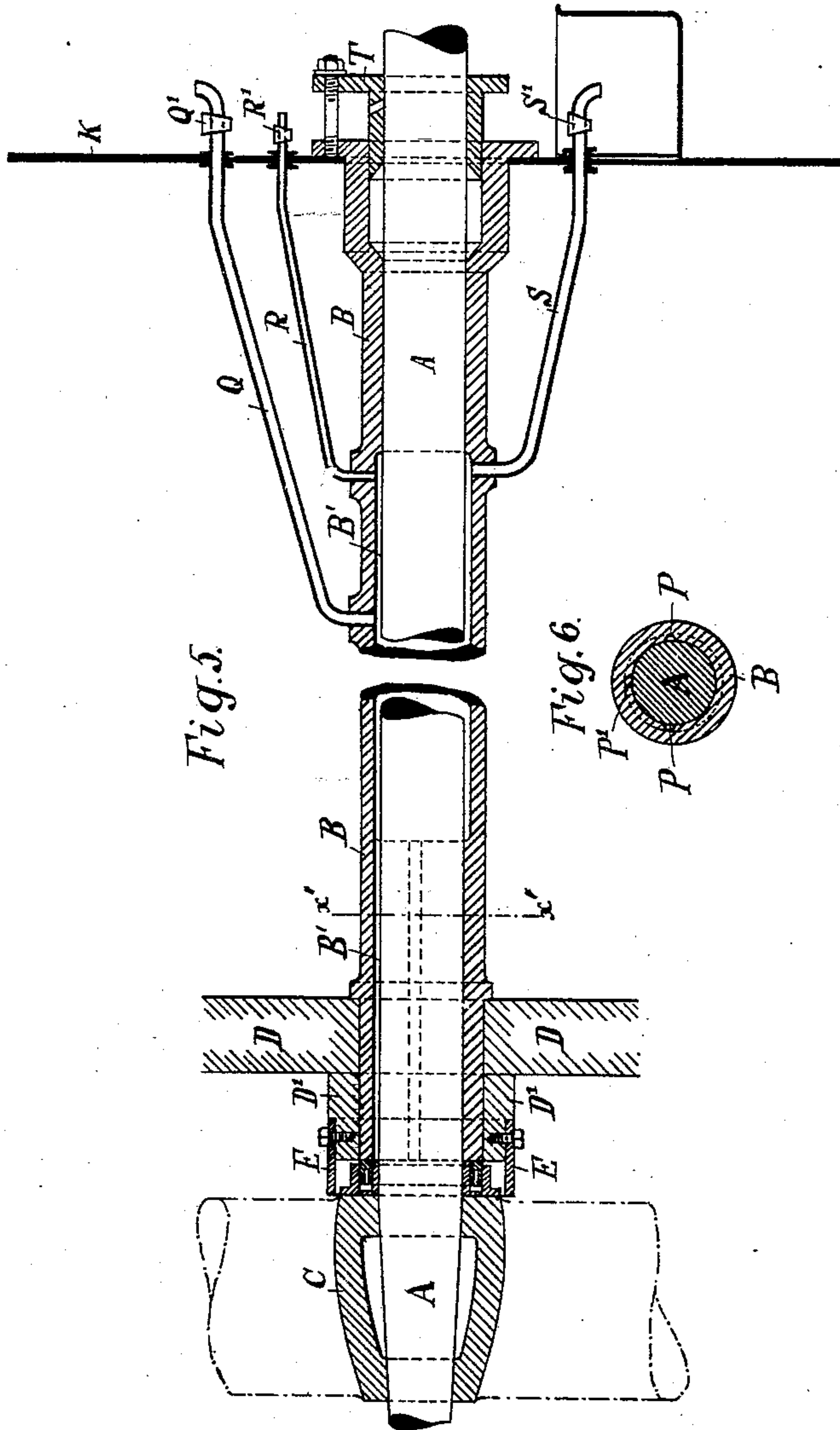
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Witnesses:
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Charles A. Halsk.

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UNITED STATES PATENT OFFICE.

FRANS REINHOLD CEDERVALL, OF GÖTEBORG, SWEDEN.

LUBRICATOR FOR PROPELLER-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 475,436, dated May 24, 1892.

Application filed October 10, 1891. Serial No. 408,341. (No model.) Patented in Sweden December 17, 1886, No. 839; in Norway July 12, 1887, No. 590; in England July 13, 1887, No. 9,854; in Germany July 13, 1887, No. 42,225, and in Denmark November 16, 1887.

To all whom it may concern:

Be it known that I, FRANS REINHOLD CEDERVALL, a subject of the King of Sweden and Norway, and a resident of Göteborg, in the Kingdom of Sweden, have invented certain Improvements in Lubricators for Propeller-Shafts, (for which I have been granted patents as follows: in Sweden December 17, 1886, No. 839; in Norway July 12, 1887, No. 590; in Great Britain July 13, 1887, No. 9,854; in Germany July 13, 1887, No. 42,225, and in Denmark November 16, 1887, this patent having no number,) of which the following is a specification.

My invention relates to a protecting-box with an oil-receptacle for propeller-boxes and to a construction of the propeller-box adapted for use with the same.

Heretofore it has been customary with the propeller-box in common use to allow the water free access to the rear or stern bearing of the box and to provide the latter with a lining of wood packing or the like in order that water only may be used as a lubricating agent. It has also been customary to fill the box with a mixture of oil and tallow in order to prevent the water from penetrating to the interior of the box and to provide a lubricant therefor. The water, which finds its way into the box in spite of these precautions, and especially salt-water, causes material corrosion of the shaft and the oil in the box becomes of a pitchy character, and this substance produces undue friction between the box and the shaft.

My invention has for its object the removal of these objectionable features by placing a protecting-box with an oil-receptacle on the shaft between the propeller and the after-peak and providing the propeller-box with oil-conduits extending to said oil-receptacle and connecting the box with a system of pipes for letting the oil in and out.

In the drawings which serve to illustrate my invention, Figure 1 is an end view of the protecting-box as seen when looking aft. The shaft is in section. Figs. 2, 3, and 4 are sections, the planes being indicated, respectively, by the lines $x x$, $y y$, and $z z$ in Fig. 1. In Fig. 2 some of the surrounding parts are shown, in addition to the box. Fig. 5 is a vertical

longitudinal section of the propeller-box on a smaller scale than the preceding figures. This view shows the protecting-box and the system of pipes for the oil. Fig. 6 is a cross-section on the line $x' x'$ in Fig. 5.

A is the propeller-shaft; B, the propeller-box; C, the boss or hub of the propeller; D, the after-peak; D', a strengthening-box screwed upon the propeller-box, and E a protecting ring or sleeve made in two parts or sections and secured to the box D' by means of screws. The purpose of this sleeve E is to form a shield for the protecting-box (to be described) and to prevent it from being injured by ice, cables, &c.

The protecting-box (see Figs. 1 to 4) consists of four concentric rings. The outer ring F, which serves as a stuffing-box, has a flange provided with screw-holes F', whereby the ring is secured to the hub C of the propeller. Into the ring F are screwed two other rings G, which bear on rings of packing G' somewhat in the manner of the ordinary stuffing-box construction. Into the annular interspace between the rings G is inserted a movable ring H, which enters an annular cavity in the ring F. The packing-rings G' serve to pack the joint between the rings F and H. The ring H is made, by preference, in two halves, which are united by dovetails and screws, as indicated in Fig. 1. Said ring H rests on spiral springs I, which are interposed between it and the base of ring F, which press the top or forward end of the ring H against the after end of the propeller-box B, or rather against a washer H', of anti-friction metal or the like, interposed between the parts B and H. The faces on which this washer bears should be ground true. This construction provides a tight joint at all times and under all conditions and keeps out the water.

Between the rings F, G, and H and the end of the box B is formed an annular oil-receptacle O, which may be supplied, as will be described, from the propeller-box compartment K. (Seen in Fig. 5.)

The ring H is compelled to rotate with the propeller and the ring F by means of hollow trunnions L, (seen in Fig. 4,) which project from the base of the ring F into the annular

space in the latter and enter or engage holes formed at the proper points in the ring H. The movement of the ring H in and out of the ring F is limited by the screws M, the head ends of which are housed in the hollows of the trunnions L, their other ends screwing into the ring H. These screws also serve to hold the parts together.

In the spaces N in the ring H (see Fig. 3) are placed bags of india-rubber or the like distended with air. These are to prevent bursting at the motions of the ring H in the event of any leak occurring and the box being thus filled with water. In order that the box may be emptied without dismounting it, a hole for that purpose is provided in the ring F, and this hole is closed by a screw *u*. (Seen in Fig. 2.)

The construction of the propeller-box to adapt it for use with my above-described protecting-box is illustrated in Figs. 5 and 6. The after-bearing in the propeller-box is provided with one or more oil grooves or channels P, extending its entire length, as seen in Fig. 6, and also with a similar channel P' at its upper side only for air. These channels connect the oil-receptacle O with the annular space B' in the box B about the shaft A and between the forward and after bearings. From the upper side of the space B' two pipes Q and R lead forward through the bulk-head or partition K, and from the lower side of same another pipe S leads forward through said bulk-head. These pipes are provided, respectively, with cocks Q', R', and S'. At the bulk-head K the box B is closed, as usual, with a gland T. When the box B is made ready, the cocks Q' and R' are opened and oil poured into the pipe Q by means of a funnel or force-pump. The entering oil forces out the air through pipe R. When oil appears at the cock R', the box is filled and the cocks Q' and R' are closed. The oil may be drawn off at the cock S'; but this drawing off and refilling need only take place about twice a month when the vessel is running.

The bearings will be so well lubricated by this device that heating can hardly occur; but should any indications of this appear the oil

should be drawn off at once. A coupling with hose from a bottom cock or pump is screwed onto the end of the pipe Q and the box-gland T loosened, after which water is forced into the box until it has cooled. After cooling it the oil drawn off can be put back again.

If it should prove to be more convenient, the protecting-box may be reversed in position and the base of the ring F be secured to the strengthening-box D'. In this case the ring H would have its bearing against the hub of the propeller.

My construction furnishes such perfect lubrication that I am enabled with it to employ larger wearing-surfaces in the soft metal of the bearings.

Having thus described my invention, I claim—

1. The combination, with a propeller-shaft, a propeller thereon, and a box B, inclosing said shaft and furnishing the bearings therefor, of a protecting-box embracing the shaft and arranged between the propeller boss or hub and the after end of the box B, said protecting-box comprising a ring F, having an annular recess to receive the ring H, the said ring H, arranged in said recess, the rings G, which screw into said ring F and bear on the packing, the said packing, and springs I, which tend to press the ring H from the recess in ring F, substantially as set forth.

2. The combination, with a propeller-shaft and propeller, of a box B, inclosing said shaft and having an oil-recess B' and channels P and P' at its after bearing, the protecting-box arranged between the propeller-boss and the after end of the box B and provided with an inclosed annular oil-receptacle O, open to the channels P P', and the cock-controlled pipes Q, R, and S, which open into the space B' within the box B, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FRANS REINHOLD CEDERVALL.

Witnesses:

CHARLES H. SHEPARD,
HUGO AUDWIDSPAN.