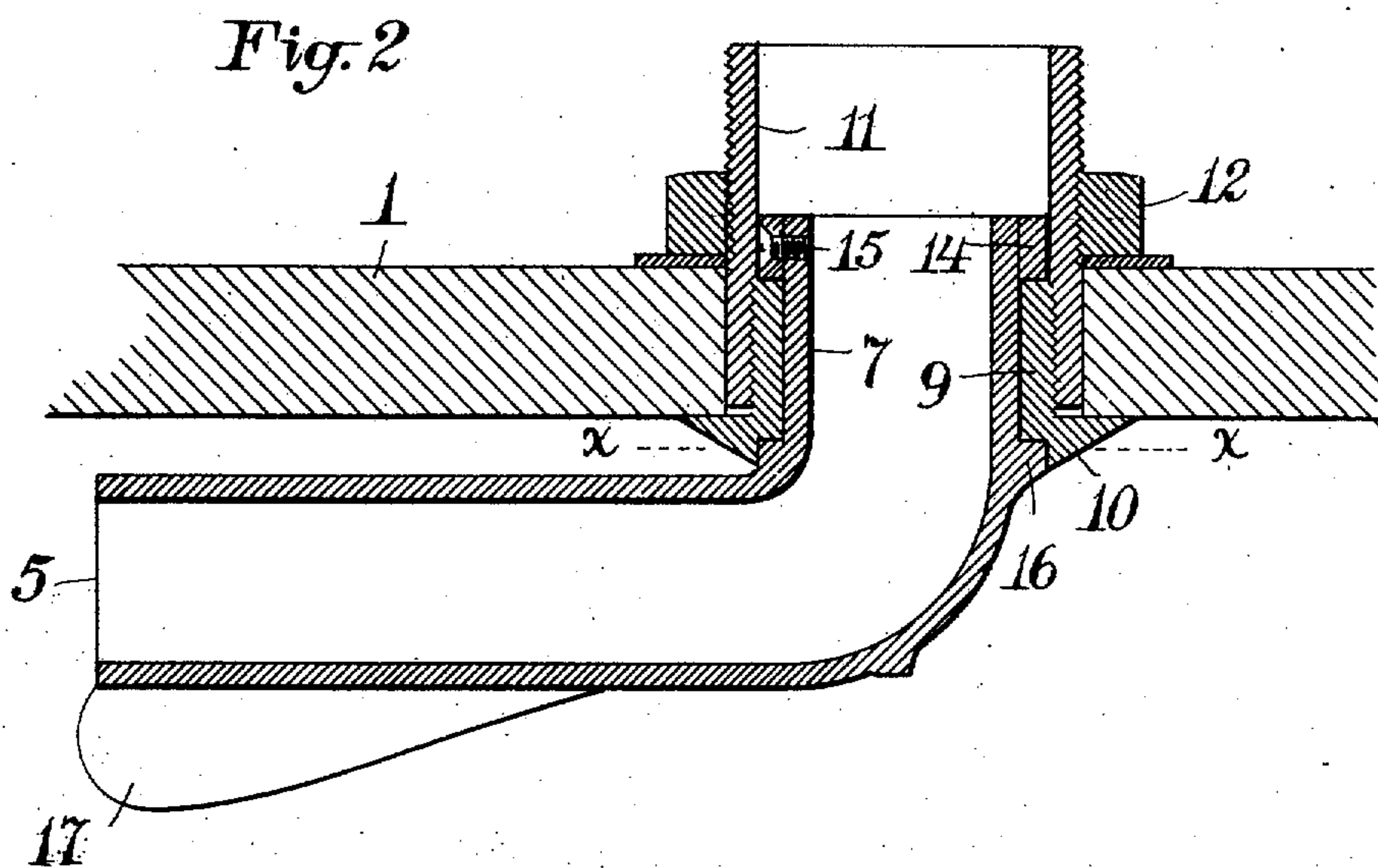


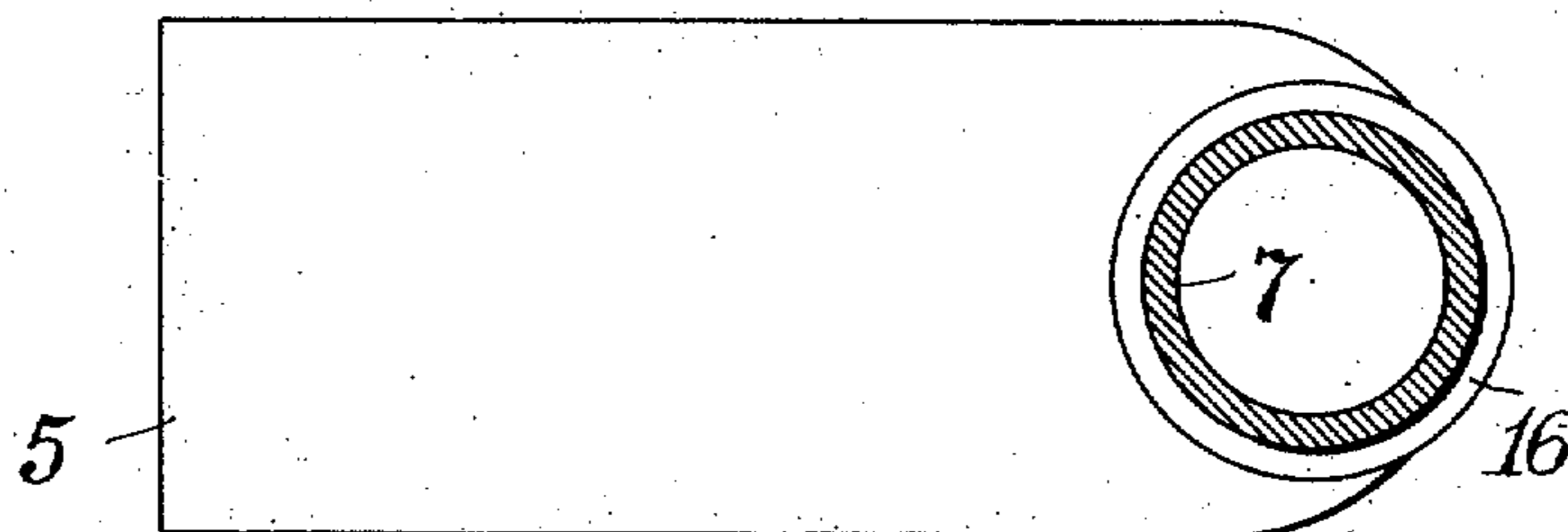
W. E. GEYER.  
EXHAUST NOZZLE FOR POWER BOATS.  
APPLICATION FILED APR. 21, 1910.

987,130.

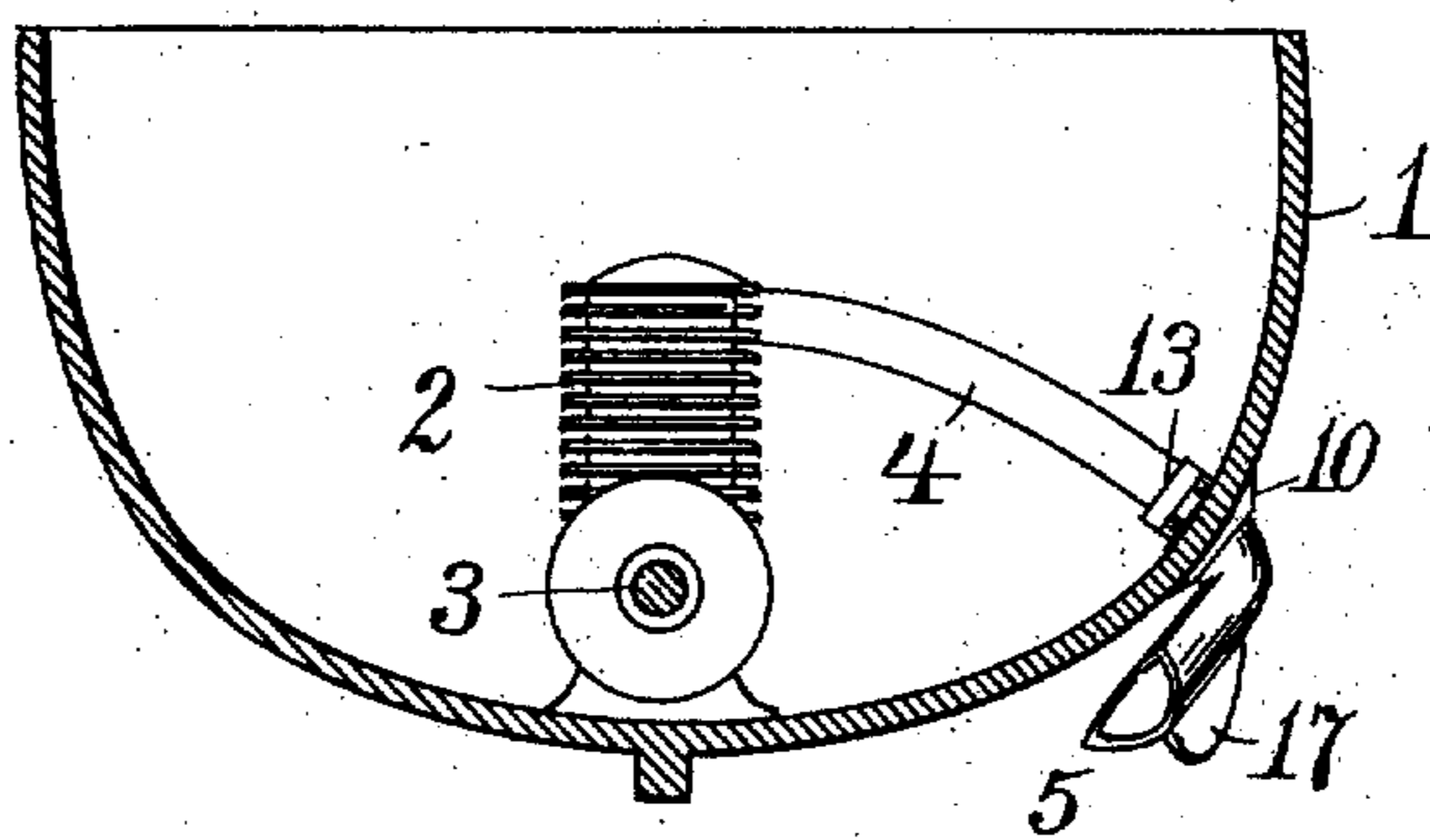
Patented Mar. 21, 1911.



*Fig. 3*



*Fig. 1*



Witnesses;

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# UNITED STATES PATENT OFFICE.

WILLIAM E. GEYER, OF CAMBRIDGE, MASSACHUSETTS.

EXHAUST-NOZZLE FOR POWER-BOATS.

987,130.

Specification of Letters Patent.

Patented Mar. 21, 1911.

Application filed April 21, 1910. Serial No. 556,804.

*To all whom it may concern:*

Be it known that I, WILLIAM E. GEYER, a citizen of the United States, and a resident of Cambridge, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Exhaust-Nozzles for Power-Boats, of which the following is a specification.

In power boats and other small craft employing internal combustion engines for their propulsion, it is customary to have the engines exhaust through a submerged nozzle directed toward the stern. A difficulty found with this arrangement is that when the boat is reversed, the intruding water interferes with the exhaust; floating debris enters the nozzle and chokes it, or drifting seaweed catches thereon.

The purpose of my invention is the construction of a nozzle for such exhaust which shall automatically change its direction of discharge to accord with the movement of the boat, and be incapable of collecting seaweed or being filled with flotsam.

Referring to the drawings forming part of this specification, Figure 1 is a cross section of a water craft showing my improved exhaust nozzle applied thereto. Fig. 2 is a longitudinal section of more or less of the same, drawn on a larger scale. Fig. 3 is a horizontal section of the nozzle on the line X—X in Fig. 2.

The boat selected for illustration is of usual construction and has its shell designated by the reference numeral 1. The internal combustion engine 2 for the rotation of the propeller shaft 3, discharges its exhaust gases through the pipe 4 to the nozzle 5 at the exterior of the boat below the water-line. Said nozzle consists of a tubular elbow the vertical member 7 of which is rotatably connected with the outer end of the exhaust pipe 4; said member preferably passing through the shell of the boat. To suitably support said elbow, said member loosely fits within a sleeve 9 which is tightly held in place in the shell by means of a shoulder 10 at the exterior, and a thimble 11 having a shoulder or nut 12 within the shell, as shown in Fig. 2. To the inner extremity of said thimble is secured the end of the pipe 4, by a union or other suitable means 13. To retain the member 7 within said sleeve, a ring 14 is fastened upon the inner end of said member, as by screws 15; the relative lengths

of said sleeve and member being such as to bring said ring just beyond the end of the sleeve.

To guard against the collection of seaweed against the upcurved part of the exhaust nozzle, the shoulder 10 is given a sharp periphery fitting close against the surface of the boat, so that it forms a frustum of a cone, the inner periphery thereof inclosing the shoulder 16 of the member 7. The exhaust nozzle being thus pivoted to freely swing fore and aft of the boat, it will be made by the pressure of the water to take a direction opposed to the direction the boat is moving. In other words, the nozzle will always take a direction to direct its exhaust in the opposite direction to that toward which the craft is moving. That the nozzle will always be thus shifted by the water, is made clear when it is noticed that its normal position when acted upon by gravity alone will be a more or less vertical one, inasmuch as its point of attachment is at the side of the boat, and not directly beneath. Consequently, when the craft is stationary and the nozzle thus pendent, the moment the boat begins to move the pressure of the water swings the nozzle rearward therewith, and the faster the motion, the more closely does the nozzle approach the horizontal. To aid in this automatic shifting of the nozzle, I prefer to provide the same with a fin 17 along its free end, as shown in Figs. 1 and 2. I also prefer to form the exhaust nozzle 5 substantially hemispherical, with its flat face toward the surface of the boat, as shown in Fig. 1, in order to provide ample discharge capacity and at the same time keep the same close to the boat-surface. Thus made, the exhaust nozzle will always be made to direct the exhaust in the same direction with the water flowing past, and so will not only relieve the exhaust of any back-pressure, but will in addition form a suction acting to increase the freedom of the exhaust. The exhaust nozzle can be readily removed by unscrewing the thimble 11 from its engagement with the sleeve 9, after which both said sleeve and nozzle can be withdrawn together.

What I claim as my invention and for which I desire Letters Patent is as follows, to wit:—

1. The combination with a boat, an engine and an exhaust means opening through the

side of the boat below the water line, of an exhaust nozzle therefor pivotally attached to the exterior of the boat to enable it to be freely swung by the action thereagainst it of the water, and so to deliver the exhaust in a direction opposite to the boat's motion through the water.

2. The combination with a boat having an engine adapted to deliver its exhaust at a point of the boat's side below the water line, of a tubular elbow having one member thereof passing through the boat's side and freely turning therein, and adapted to receive the exhaust through said member and to deliver it into the water.

3. The combination of a boat having an opening through its side below the water line, an engine adapted to deliver its exhaust to said opening, a tubular elbow having one member thereof rotatably supported in said opening and receiving said exhaust, the other end of said elbow being at the exterior of the boat, and a fin located at the last-named end.

4. The combination with a boat having an opening through its side, and an engine adapted to deliver its exhaust at said opening, of an exhaust nozzle comprising an elbow one member of which is rotatably held by said boat in said opening to receive the exhaust, the discharge member of the nozzle

being substantially semicylindrical with its flat face toward the surface of the boat.

5. The combination with a boat having an opening through its side, and an engine having a pipe for delivering its exhaust to said opening, a sleeve fixed in said opening, an exhaust nozzle having one member rotatable in said sleeve and its other member substantially parallel with the surface of the boat, and a ring fixed to the inner end of said rotatable member and bearing against the inner end of said sleeve.

6. The combination with a boat having an opening through its side, and an engine having a pipe for delivering its exhaust to said opening, a sleeve fixed in said opening and having a conical flange or shoulder fitted against the outer surface of the boat, and an exhaust nozzle having one member rotatably mounted within said sleeve and formed with a shoulder inclosed by said flange or shoulder, the other member of said nozzle being substantially parallel with the surface of the boat.

In testimony that I claim the foregoing invention, I have hereunto set my hand this 20th day of April, 1910.

WILLIAM E. GEYER.

Witnesses:

A. B. UPHAM,  
D. W. PENTZ.