

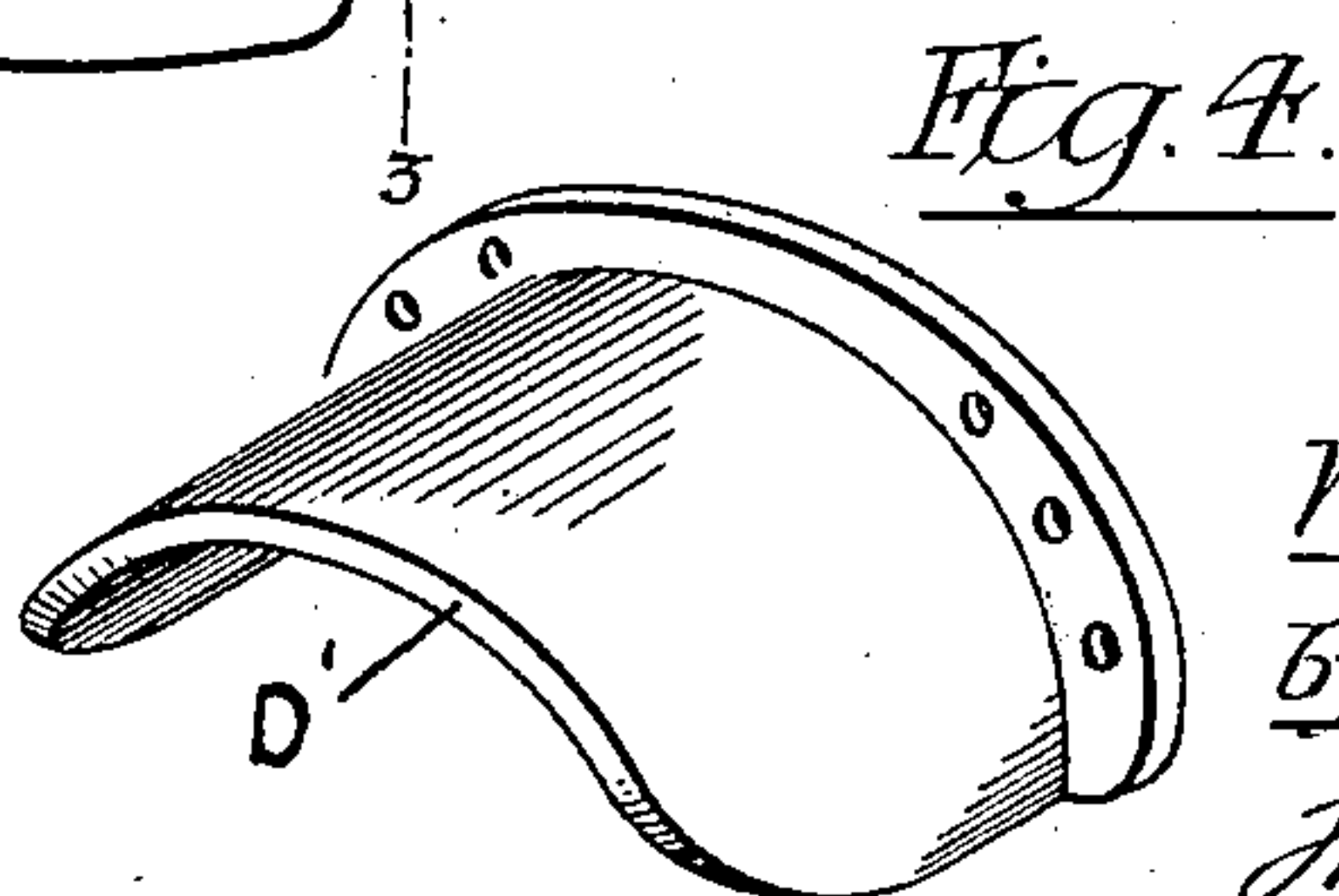
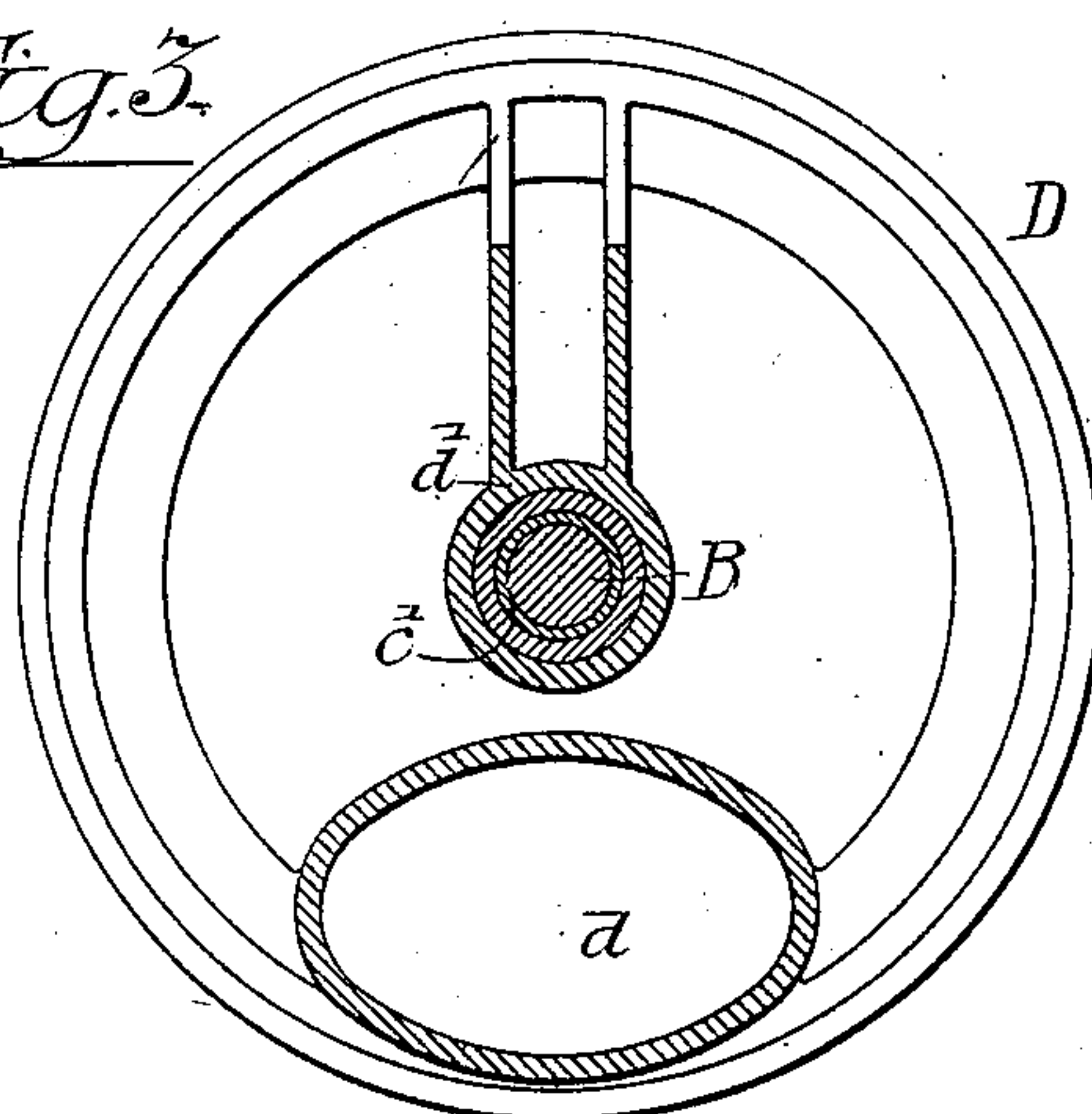
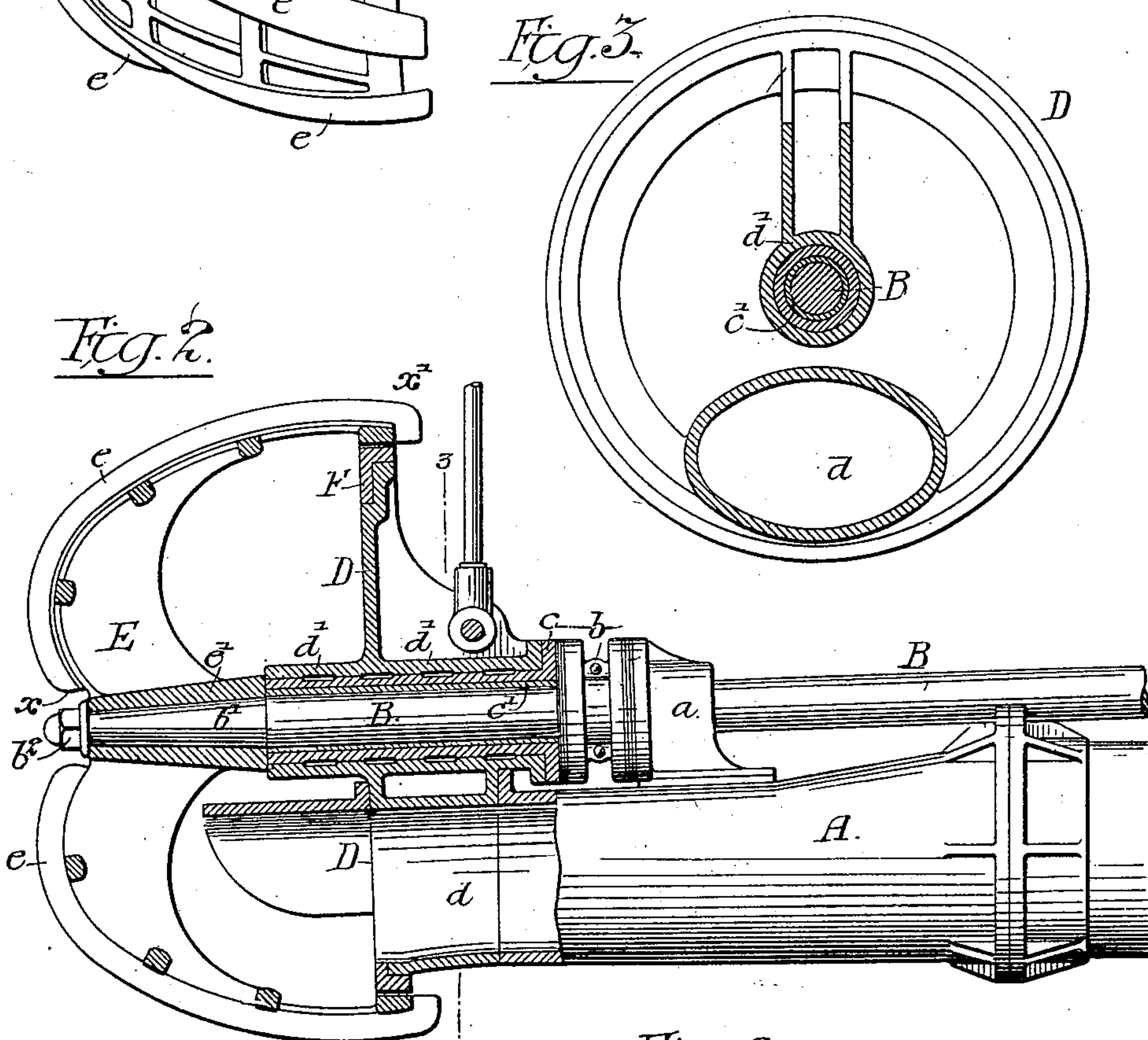
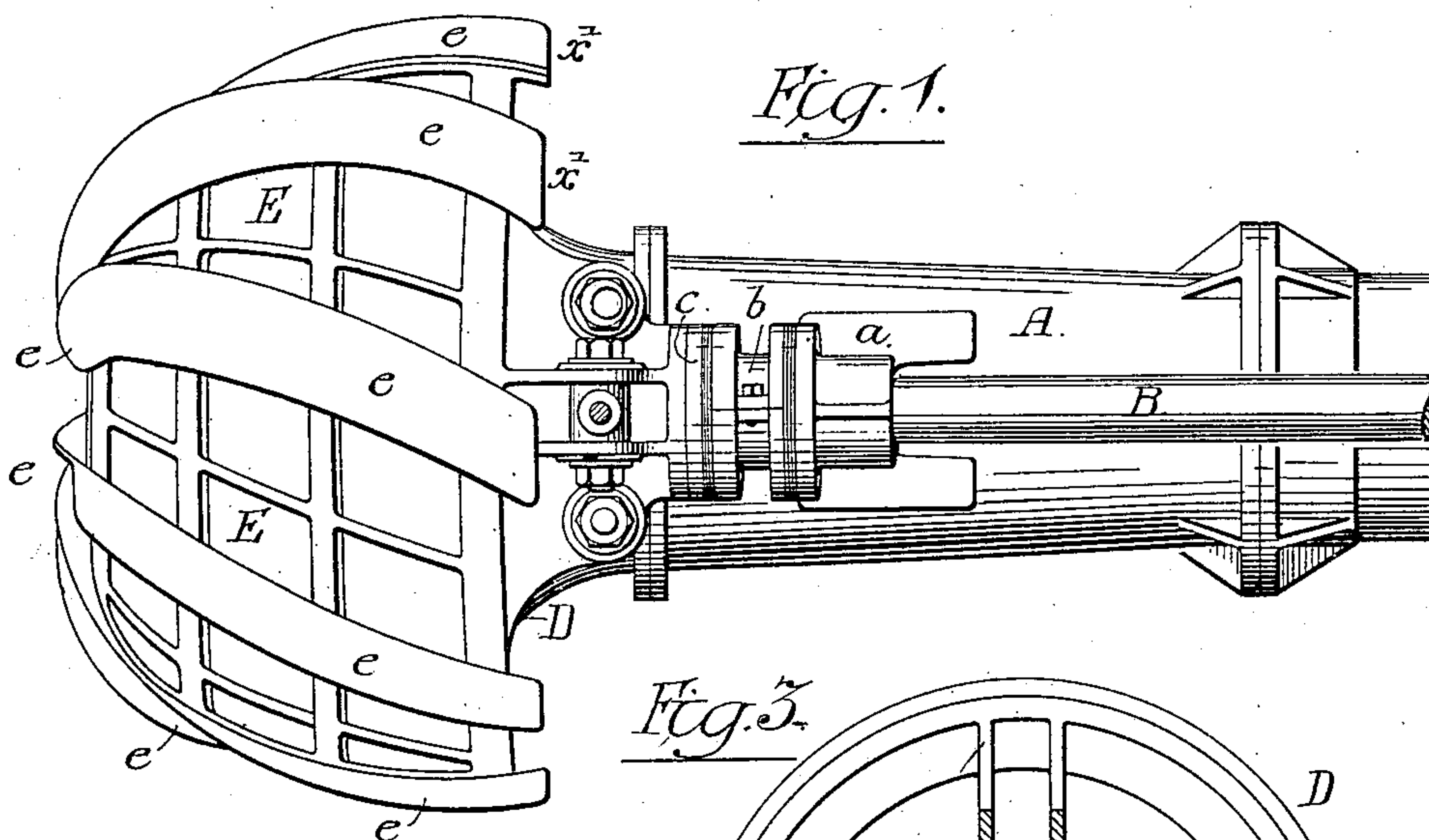
No. 682,024.

Patented Sept. 3, 1901.

W. J. BRADLEY.
CUTTER HEAD FOR HYDRAULIC DREDGES.

(Application filed Apr. 28, 1900.)

(No Model.)



Witnesses:-

Wm. A. Barr.
Louis H. F. Whitehead.

Inventor:-

William J. Bradley.
by His Attorneys:-
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UNITED STATES PATENT OFFICE.

WILLIAM J. BRADLEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE AMERICAN DREDGING COMPANY, OF SAME PLACE.

CUTTER-HEAD FOR HYDRAULIC DREDGES.

SPECIFICATION forming part of Letters Patent No. 682,024, dated September 3, 1901.

Application filed April 28, 1900. Serial No. 14,729. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. BRADLEY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Cutter-Heads for Hydraulic Dredging Apparatus, of which the following is a specification.

The objects of my invention are to improve the construction of cutter-heads of hydraulic dredging-machines, so that they will withstand the strains to which they are subjected, to prevent the thrust in either direction of the driving-shaft, and to prevent the accumulation of material back of the cutter-head, as fully described hereinafter.

In the accompanying drawings, Figure 1 is a plan view showing my improved cutter-head with a portion of the suction-pipe. Fig. 2 is a side view of Fig. 1, partly in section. Fig. 3 is a section on the line 3-3, Fig. 2; and Fig. 4 is a detached perspective view of the extension-hood of the suction-pipe.

A is the suction-pipe, and B is the driving-shaft, for the cutter-head. The suction-pipe A is attached to a circular back plate D, which has an opening d in line with the opening of the suction-pipe. This back plate has a long bearing d' for the shaft B. In this bearing is a flanged bushing c , and shrunk on the shaft B is a sleeve c' , so that the shaft accurately fits the bearing. The bearing of the cutter-head of a suction-dredge is subjected to considerable wear, and therefore the bushing must be so arranged that it can be readily withdrawn from the bearing and replaced. I preferably flange the bushing at one end, as shown in Fig. 2, and between this flange and a thrust-bearing a on the suction-pipe is placed a collar b , which is made in two parts and secured to the shaft B. This collar holds the shaft against longitudinal displacement and takes the downward thrust of the shaft, as well as the thrust due to cutting.

E is a hollow open frame, forming the cutter-head, shaped as clearly shown in Figs. 1 and 2, having a curved outer surface. This frame incloses the back plate D, to which the bearing is secured. Attached to the frame at intervals are curved cutting-blades e . These blades extend from the point x near

the axis to the point x' beyond the back plate D. The frame has a hub e' , and the hub is secured to the tapered end b' of the frame B and is held against the bearing by a nut b^2 on the screw-threaded end of the shaft. The circular back plate D has a detachable flange F secured to its periphery. This flange is L-shaped in cross-section and fits between the back plate and the frame E, so that when it is necessary to replace the parts owing to wear all that is necessary is to remove the old flange F and substitute a new flange for it, which can be shaped to fit the back plate as well as the frame E. In hydraulic dredging-machines having cutter-heads of this type the material piles up back of the cutter-head, so that it is difficult to swing the suction-pipe and its cutter. By extending the blades beyond the back plate the earthy material is agitated at the back of the plate as well as in front of the cutters, so that the suction will draw in the material which would otherwise pile up at the back of the plate, thereby allowing the suction-pipe to be readily moved laterally. By arranging the bearings as shown the downward thrust due to the weight of the shaft is taken by the bearings, as is also the thrust due to the pressure against the cutter-head. Metallic plates are placed between the bearings and a collar on the shaft. These plates can be readily renewed when necessary, and if it is desired the bushing and sleeve can be removed and a new bushing and sleeve placed in position.

The operation is as follows: The suction-pipe is let down into the water so as to come in contact with the portion of the bottom to be removed, the shaft is rotated by any suitable power mechanism, and the cutter-head cuts into the bottom, removing a portion of the bottom, and the portion cut away is drawn into the suction-pipe by the action of the suction-pump on the dredge. In some cases when the dredge is working on sticky material, such as clay, I find it desirable to extend the suction-pipe into the cutter-head. In such a case a hood D' may be secured to the back plate D, as shown in Fig. 2, so that the suction will free the outer end portions of the cutter-head from the material. In construct-

ing this hood D', I preferably close the top and sides and leave the bottom open, as shown in Fig. 4.

I claim as my invention—

5 1. The combination of a suction-pipe for a hydraulic dredging apparatus, a back plate secured to the suction-pipe and having an opening in line with the opening in the suction-pipe, a bearing on the back plate, a shaft
10 mounted in the bearing, a frame carried by the shaft, blades on the frame, and a removable flange secured to the periphery of the back plate and mounted between the back plate and the frame, substantially as de-
15 scribed.

2. The combination of a suction-pipe for a

hydraulic dredging apparatus, a back plate having an opening therein in line with the suction-pipe, a bearing on the back plate and a bearing on the suction-pipe, a shaft passing 20 through the bearings, a collar on the shaft mounted between the two bearings, a frame secured to the shaft in front of the back plate, and blades secured to the frame, substantially as described. 25

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM J. BRADLEY.

Witnesses:

WILL. A. BARR,
JOS. H. KLEIN.