(No Model.)

2 Sheets—Sheet 1.

C. J. BALL.

Dredging Apparatus.

No. 237,155. Patented Feb. 1, 1881.

Fig. 1.

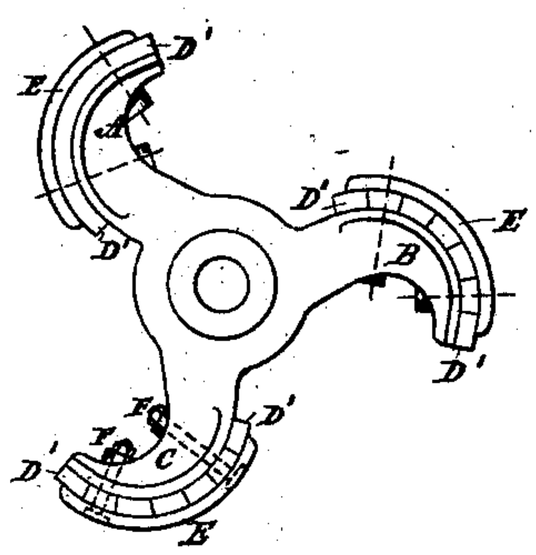


Fig. 2.

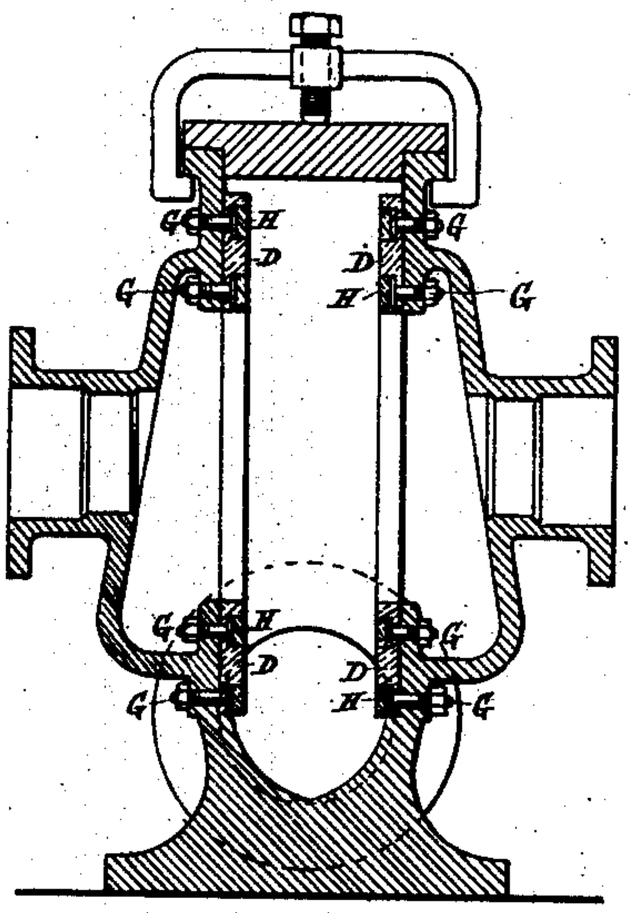
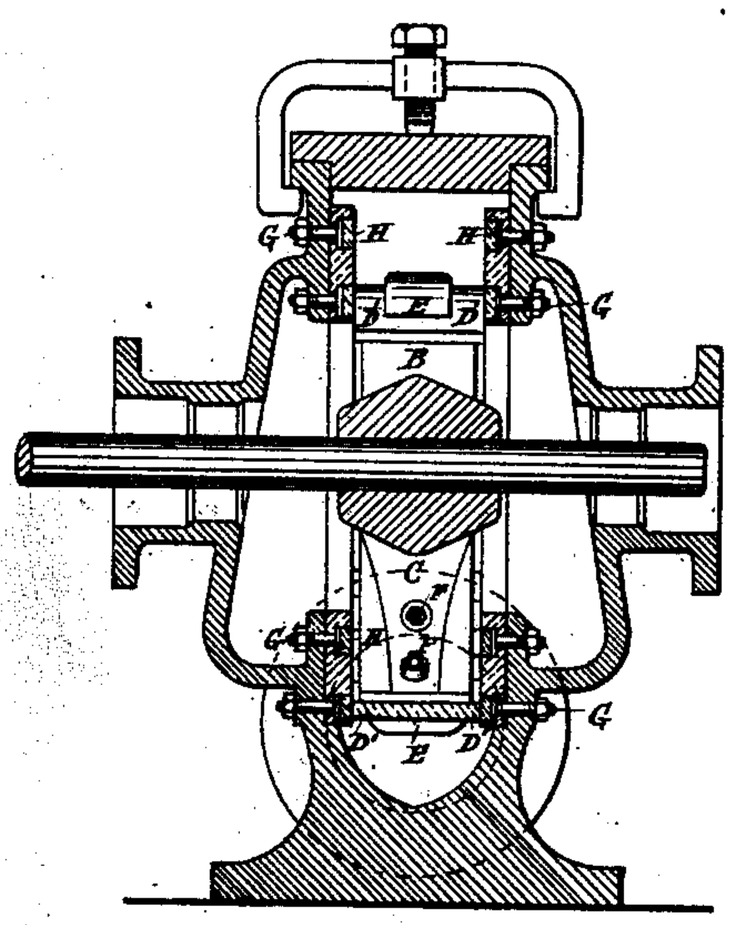


Fig. 3.



ATTEST=

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Burke, Fraser & Connell.

(No Model.)

2 Sheets—Sheet 2.

C. J. BALL.

Dredging Apparatus.

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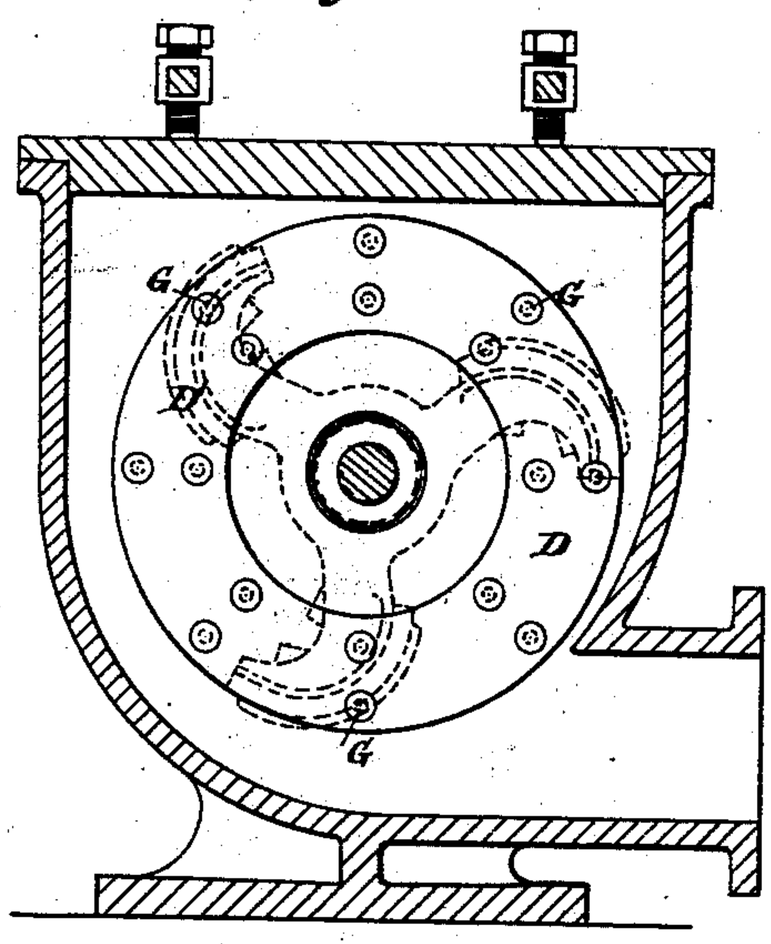
Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES J. BALL, OF LONDON, ENGLAND.

DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 237,155, dated February 1, 1881.

Application filed October 8, 1880. (No model.) Patented in England March 12, 1878, in France April 30, 1878, in Belgium May 2, 1878, in Italy September 30, 1879, and in Spain January 15, 1880.

To all whom it may concern:

Be it known that I, CHARLES JULIUS BALL, of the city of London, England, have invented certain Improvements in Dredging Apparatuses, of which the following is a specification.

This invention relates to improvements in rotary dredging apparatus and rotary apparatus of a similar character; and it consists, essentially, in providing the rotary part of the apparatus with detachable yielding pads where the said parts rotate adjacent to the casing, said pads being arranged to project laterally beyond the metal of the rotary part, so as to permit of considerable elastic play or movement in yielding. The casing is also provided on each side with an elastic or yielding ring, arranged to cover that part of the sides of the casing adjacent to which the pads on the arms rotate, all as will be more fully hereinafter set forth.

In the drawings which serve to illustrate my invention, Figure 1 is a view of the fan removed from its casing. Fig. 2 is a vertical section taken through the center of the fan or pump-casing in the plane of the fan-axis. Fig. 3 is a similar section, showing the fan also in section. Fig. 4 is a vertical section taken through the casing in a plane at right angles to the sections in Figs. 2 and 3. In this view the fan is shown in dotted lines.

Referring to Fig. 1, A, B, and C represent the three arms of the fan, which have curved or convex extremities, to receive rubber or other yielding pads D′. On the arm A the pad is shown in one piece; but on the arms B and C it is made up of pieces or segments. This latter form is preferred, as it offers facilities for renewing any portion that may become worn. The casing is somewhat wider than the arm of the fan, and the pad D′ projects laterally beyond the metal of the arm at both sides, as shown. The pad is held in place on the arm by means of a plate or shield, E, of metal or other strong material. Bolts F pass through the metal or other shield, the pad, and the arm, and thus bind the whole securely together.

The sides of the casing are provided with annular or washer-like rubber shields D, which are wide enough to cover the space included in the travel of the pads on the arms of the fan, and the said pads travel, when the fan is rotated, in close proximity to the said shields on the casing. In Fig. 2 I have shown how the shields D are attached to the casing by means of bolts G. The heads of these bolts are sunk into recesses in the rubber shields to prevent their contact with the fan-pads, and plugs of india-rubber, H, are fitted into the recesses over the bolt-heads to preserve the continuity of the surface.

My apparatus is employed in lifting dredged material containing grit and stones, and these get between the casing and the rotative parts adjacent thereto, cutting away the metal when it is not protected by a yielding material like rubber, and causing serious damage. Therefore I contemplate the protection of these metallic parts, as herein shown, by arranging the pads on the arms to project laterally beyond the metal of the same, so as to permit of considerable freedom for elastic play, and by equipping the sides of the casing adjacent thereto with a similar material.

I am well aware that blowers or fans for sand-blasts have been proposed, in which the inner face of the blower-casing has been covered with a yielding material, as well as the faces of the fan-blades, the object being to protect the metal from the abrading action of the sand; and I am also aware that rubber packing-blocks have been inserted in the rotary pistons of hydraulic pumps, the said packing-blocks playing on the metallic walls of the casing, the object being to pack the piston. These, however, are constructed differently from my apparatus herein described, wherein the rubber pads on the arms of the rotating fan project laterally beyond the edges of the arm and rotate adjacent to rubber ring-plates on the sides of the casing. I no not aim to pack the fan, and it would do its work quite well without pads; but my object is to protect the fan from injury arising from grit or stones getting between the blades and the casing.

Having thus described my invention, I claim—

1. A dredging apparatus comprising a casing equipped with yielding ring-pads on its inner vertical faces, and a fan having arms with convex faces provided with yielding pads, the

edges of which extend laterally over the metal of the arms and rotate adjacent to the yielding pads on the casing, substantially as and for the purposes set forth.

2. The combination, with the curved arms of the fan A B C, made narrower than the casing, as described, of the yielding pads D′, secured to the convex faces of the arms, and their edges arranged to project laterally beyond the arms on both sides, the casing in which the fan is inclosed, and the yielding washer-like pads D, secured to the interior walls of the casing adjacent to the circle of travel of the pads on the arms of the fan, substantially as and for the purposes set forth.

3. The combination, with the fan having arms with convex faces, of the rubber pads D′, made in sections, and secured thereto by plates E, the pads being arranged to project beyond the faces of the arms on both sides, as and for the purposes set forth.

4. The combination, with the casing, of the following elements, namely: the fan provided with yielding pads on its arms, the pads D, secured to the inner faces of the casing, the securing-bolts G, the heads of which are recessed in the pads D, and the rubber plugs H, inserted over the bolt-heads to preserve the continuity of the surface, substantially as set forth.

CHAS. J. BALL.

Witnesses:
C. GROSSETITE,
S. CRAUSA.