(No Model.)

W. P. HUMPHREYS.

JOINT FOR SUCTION PIPES.

No. 444,099. Patented Jan. 6, 1891.

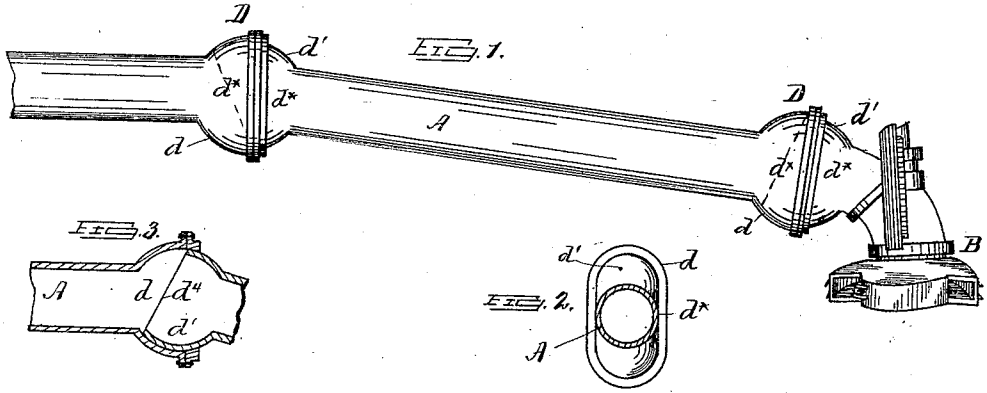


Fig. 1.

Fig. 3.

Fig. 2.

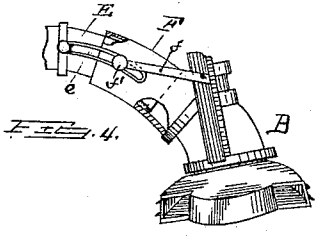


Fig. 4.

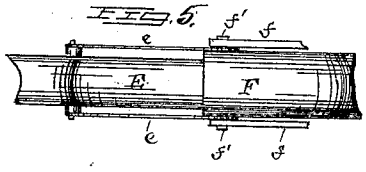


Fig. 5.

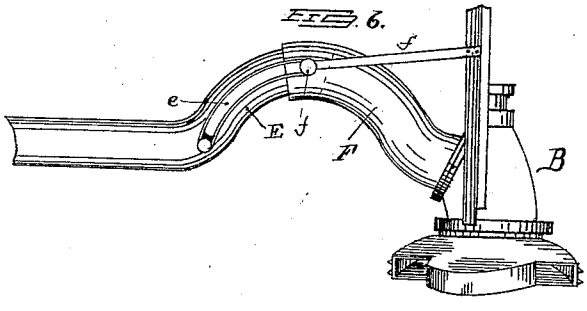


Fig. 6.

WITNESSES

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JOINT FOR SUCTION-PIPES.

SPECIFICATION forming part of Letters Patent No. 444,099, dated January 6, 1891.

Application filed April 15, 1890. Serial No. 348,136. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. HUMPHREYS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Joints and Connections for Suction-Pipes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to dredging apparatus, and has for its object the provision of certain improvements in the manner of connecting the suction-pipe both at the point where it joins the pipe on the boat and at its juncture with the cutter. The connection between the suction-pipe and the boat-pipe is particularly adapted for use where the suction-pipe is to have only a vertical movement, and the same connection when applied to the joint between the suction-pipe and cutter gives a like movement and allows the cutter to have a vertical swing, by means of which it will always rest and work horizontally on the bottom at whatever inclination the suction-pipe may be set.

The form of joint described in this application as being applicable to both the situations above named is of peculiar construction, and I have denominated it an "oblate spheroidal socket-joint," as being descriptive of its form and resultant function, as will be understood from the detailed description hereinafter given. I may, however, employ a different form of connection between the suction-pipe and cutter, as at this point curved telescoping pipes are very well adapted for the requirements of the work, and in this invention such are included.

My invention will be better understood from the following detailed description.

The accompanying drawings illustrate what I consider the best means for carrying my invention into practice.

Figure 1 is a side elevation of a suction-pipe and cutter having oblate spheroidal joint-connections. Fig. 2 is an end view of one of such joints. Fig. 3 is a longitudinal vertical section of one of them. Fig. 4 is a side elevation of a curved telescoping-pipe joint for connecting the cutter to the suction-pipe. Figs. 5 and 6 are respectively a plan and a side elevation of a somewhat modified form of telescoping-pipe joint.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A is the suction-pipe, and B is the cutter, these parts being substantially of the same general form as those shown and described in various patents issued to me in 1889, and the suction-pipe may be provided with a jacket and the joint at the boat may have trunnions upon it, as provided in my previous patents.

D D are the oblate spherodial joints disposed, as shown, one at the boat and one at the outer end of the suction-pipe. These joints may, however, as will be readily understood, be used with good effect in many positions besides those here shown. As their name indicates, these joints are formed on the ends of two connecting-pipes, one shaped as a socket and the other as a head, both having flattened sides and rounded top and bottom. The socket is marked d, the head d', and the flattened sides d^* d^*. This form of joint permits easy vertical movement of the suction-pipe at the boat and of the cutter on the suction-pipe, so that the suction-pipe may be made to assume any angle which is practical with reference to boat and work, and the cutter will always set level on the bottom and be kept squarely to its work. To facilitate the movements of the joints and at the same time to permit a wide range of movement without having the head of the joint interfere with the opening from the socket into its communicating pipe, I have devised a construction of head which consists in the opening therein at an oblique angle to the axis of the pipe, as shown at d^4. As will be seen, when the long side of the head is at the top of the joint, as shown by dotted lines at the boat end of the suction-pipe, the suction-pipe may be turned down to almost a right angle before the head would interfere with the discharge from the socket, and so when the position of the joint is inverted, as shown at the cutter end of the suction-pipe, the cutter can be

turned up to compensate for the different angles of the suction-pipe and always retain a horizontal position without interfering with the discharge into the suction-pipe. This form of joint is therefore peculiarly adapted for use in the positions indicated, both because its spheroidal shape prevents it from turning sidewise and straining the parts as well as on account of the oblique shape of the head in the socket.

The joint connecting the cutter to the suction-pipe may be made in the form of telescoping pipes, and I have devised a construction by which easy action is secured and the operations of the dredger preserved and facilitated. Such construction is shown in Figs. 4, 5, and 6, where E and F are curved pipes telescoping on each other, the exterior one being preferably connected to the cutter. They may be made of sufficient length and curve to describe any arc from a half-circle down. As shown in Fig. 4, they make about a quarter-circle, and as shown in Figs. 5 and 6 they cover about a half-circle; but the principle is the same in each. The larger arc permits a wider range of movement to the pipes, for, as will be seen, this joint will give a movement to pipes connected by it of at least forty-five degrees or more.

In connection with the telescoping pipes I provide a brace *f*, connecting the exterior pipe to the part with which it joins, in this instance to the standards of the cutter, and also provide a slip-connection between the exterior and interior pipes, which consists of an arm of the same curve as the pipe and slotted, as shown at *e*, which slot rides upon a slot-pin *f'*, which may also form the attachment for the brace *f*. The brace *f* assists in pressing the pipe F upon the pipe E and also steadies the movement and prevents strain and friction, while the curved slotted arm guides the pipes upon each other and holds them reliably together. The brace and arm may be applied to either of the forms of telescopic joint, as shown.

The portions of the joints which move upon each other are suitably packed whether they be spheroidal or telescoping.

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

1. A joint for suction-pipes, consisting of the ends of two pipes having oblate spheroidal form, as set forth.

2. A joint for suction-pipes, consisting of the ends of two pipes having oblate spheroidal form and the inner one of said pipes being cut away at an oblique angle, the long side being underneath, as set forth.

3. The combination, with a suction-pipe and cutter, of curved telescoping pipes connecting them, as set forth.

4. The combination, with a suction-pipe and cutter, of curved telescoping pipes connecting them, and a slotted and bowed arm connected to one part and sliding over a pin secured upon the telescoping pipe connected to the other part, as set forth.

5. The combination of the curved telescoping pipes, a rigid arm connecting the outer one to the part to which said pipe is attached, and a slotted curved arm connected to the inner pipe and sliding over a pin on the outer pipe, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM P. HUMPHREYS.

Witnesses:
I. N. KALB,
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