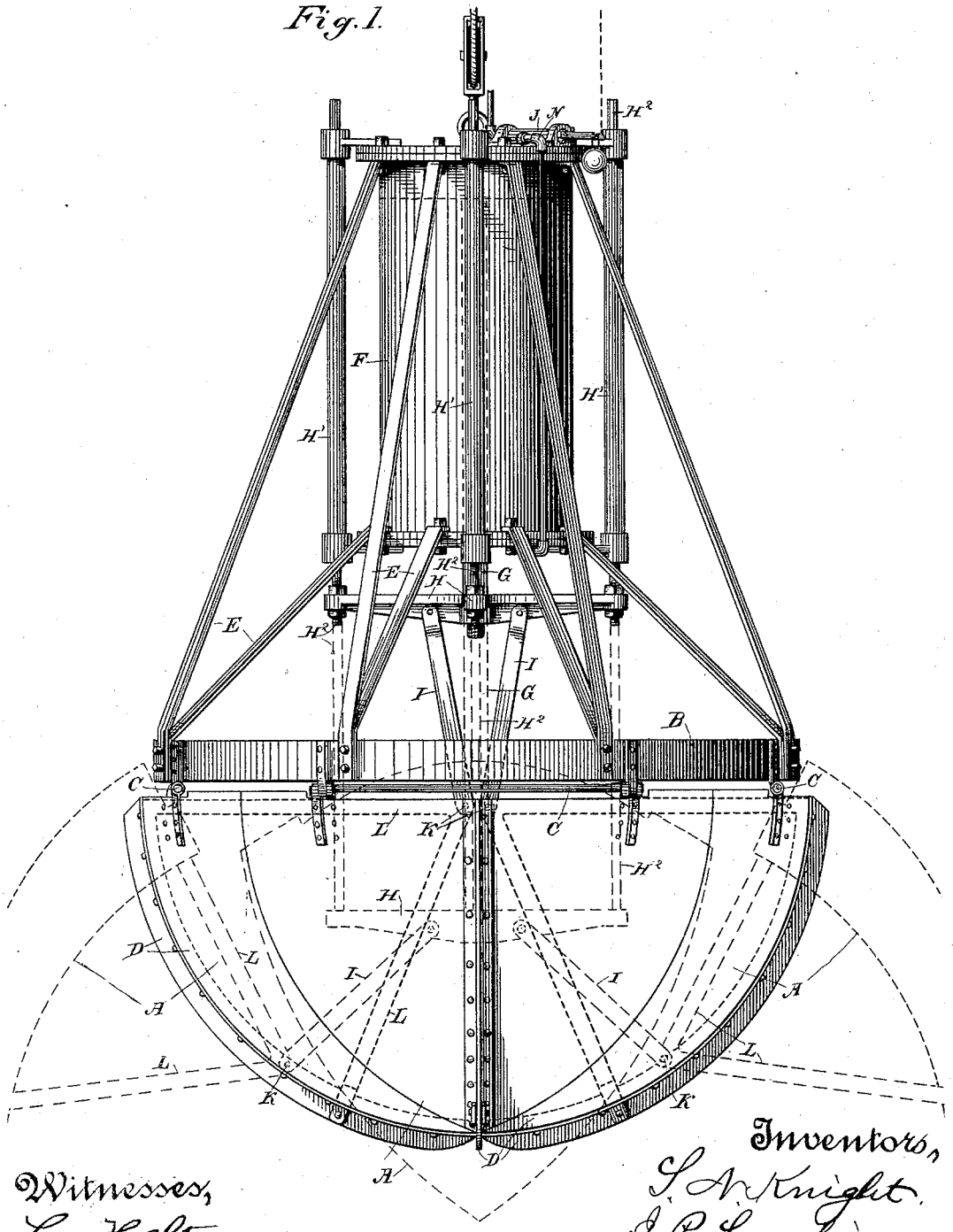
(No Model.) 2 Sheets—Sheet 1.

S. N. KNIGHT & I. P. LAMBING.

DREDGING MACHINE.

No. 385,759. Patented July 10, 1888.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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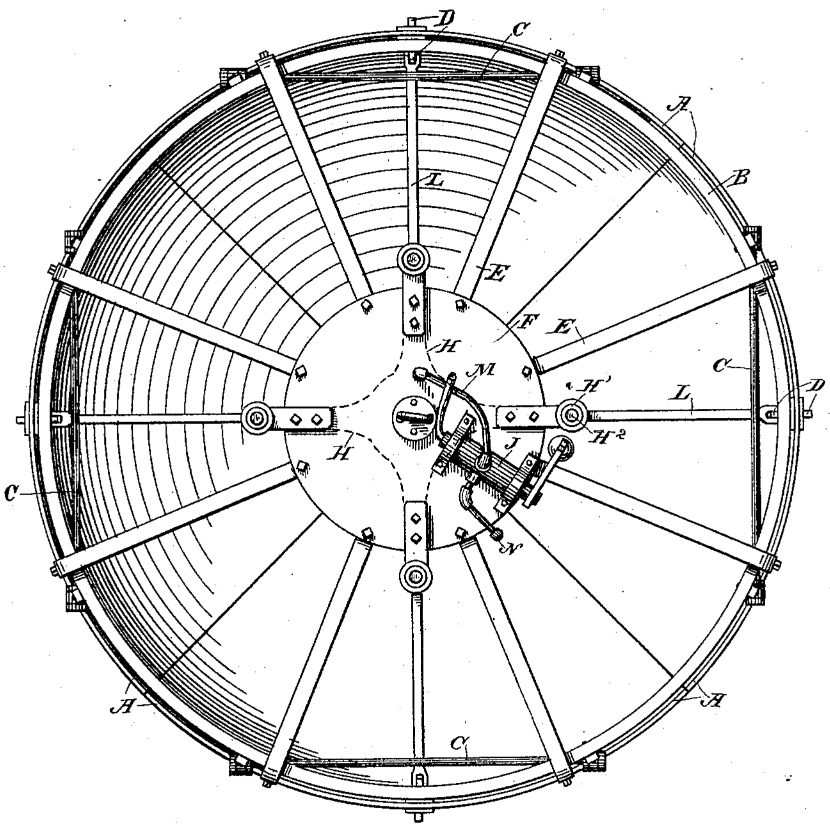
Fig. 2.



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UNITED STATES PATENT OFFICE.

SAMUEL N. KNIGHT, OF SUTTER CREEK, AND ISAAC P. LAMBING, OF IONE, CALIFORNIA.

DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 385,759, dated July 10, 1888.

Application filed November 25, 1887. Serial No. 256,163. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL N. KNIGHT, of Sutter Creek, Amador county, State of California, and ISAAC P. LAMBING, of Ione, Amador county, State of California, have invented an Improvement in Dredging-Machines; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to an improved dredging-bucket and mechanism for opening and closing the same; and it consists in the constructions and combinations of devices, which we shall hereinafter fully describe and claim.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a view showing the bucket closed and the dotted lines show it opened. Fig. 2 is a plan view of the same.

The bucket is composed of from three to six or more sections, A, which, when closed together, will form a hollow hemisphere. These sections are formed of sheet iron or steel having the base or broadest portion hinged to a strong iron circle, B, by hinge-pins C. From this hinged base the sections diminish on convex lines to sharp points, which are presented downward, so that they may enter the earth or material being excavated like a sharp-pointed spade. These sections are strengthened by strong angle or other iron ribs, D, which are riveted upon the inside and outside of the bucket, as shown.

From the circle B stout angular brace-rods E extend upward and support the upper and lower ends of a cylinder, F, which stands vertically above the center of the circle, from which it is rigidly supported by the rods. Within this cylinder is a piston having a piston-rod, G, projecting downward through the lower head, as shown. The lower end of this piston-rod has a yoke, H, fixed to it. Guides H′ are fixed to extend down parallel with the cylinder, and the rods H^2, having their lower ends fixed to the yoke H, slide within or upon the guides H′, and thus guide and steady the yoke and piston-rod.

Rods or links have their upper ends hinged to this yoke, while the lower ends extend downward and connect by hinge-pins with the inner sides of the buckets at a point a little nearer the apex than the hinged joints of the bucket-sections. The rods may be in one piece and straight; but in order to give the best power for closing the bucket in the last portion of its closing movement we prefer to joint the rods I, as shown at K.

L is a rigid brace-rod, extending inwardly from the upper sides of each bucket-section to meet the parts of the jointed rod I at K.

M is a hose or pipe leading to the upper part of the cylinder, and N is a similar hose or pipe leading to the lower part of the cylinder and controlled by a valve, J. The cylinder, circle, and bucket-sections are all suspended from a crane or other lifting apparatus by a hook or other device, so that the bucket may be let down to the material which is to be excavated, and after being filled and closed it may be raised up again.

The operation will then be as follows: The buckets are opened by admitting steam, compressed air, water, or other medium above the piston, forcing it downward within the cylinder, and with it its piston-rod and the yoke H. This acts upon the links or rods I, and through them upon the segments of the buckets, forcing them open with the sharp points presented downwardly. The whole device is then lowered until the points rest upon the material to be excavated, when the upper inlet-passage to the cylinder is closed and the lower one is opened, allowing the steam or air or water to enter below the piston, and thus force it up, the upper exhaust being also opened. The action upon the connecting rods or links I will be such as to force the sharp points of the bucket-sections into the material to be excavated, the weight being sufficient to cause them to sink into it, while at the same time they are being closed by the upward movement of the piston. The peculiar angular arrangement of the jointed connecting rods or links I, above described, causes them to act with greater force to close the bucket-sections at the last part of their movement, and to force them through the material, especially if it be tough or difficult to dig. When closed, the bucket forms a nearly tight and perfect hemisphere, and the whole apparatus may then be lifted by the crane or other lifting apparatus and transported to the

place where it is desired to drop the load. By constructing the bucket-sections of the hemispherical form and with the sharp points their effectiveness in digging the material will be greatly increased.

Having thus described our invention, what we claim as new is—

1. The spherical sections having their bases hinged to a circular ring and their points presented downward, so as to close about the hinges and form a hollow hemispherical bucket, in combination with a pressure cylinder supported vertically above the center of the ring by brace-rods therefrom, a piston and piston-rod operating within said cylinder, and links or rods connecting said piston with the bucket-sections, so that they may be opened and closed by the movement of the piston, substantially as herein described.

2. The circle or ring having the spherical segmental bucket-sections hinged to it, the central vertical cylinder supported above the ring by brace-rods therefrom, the piston-rod actuated by the piston within the cylinder and having a yoke at its lower end, and guides therefor, in combination with the hinged links or connecting-rods I, connecting said yoke with the bucket-sections, substantially as herein described.

3. The spherical segmental bucket-sections hinged to the ring or circle, the cylinder supported vertically above the center of said ring or circle and having the piston and piston-rod, in combination with the jointed links or rods connecting said piston-rod with the bucket-sections, and brace-rods L, extending from the upper part of the bucket to the joints K of the links, substantially as herein described.

In witness whereof we have hereunto set our hands.

SAMUEL N. KNIGHT.
ISAAC P. LAMBING.

Witnesses:
S. H. NOURSE,
H. C. LEE.