(No Model.)

2 Sheets—Sheet 1.

W. A. T. SARGENT.

DREDGING BUCKET.

No. 263,230. Patented Aug. 22, 1882.

Fig. 1.

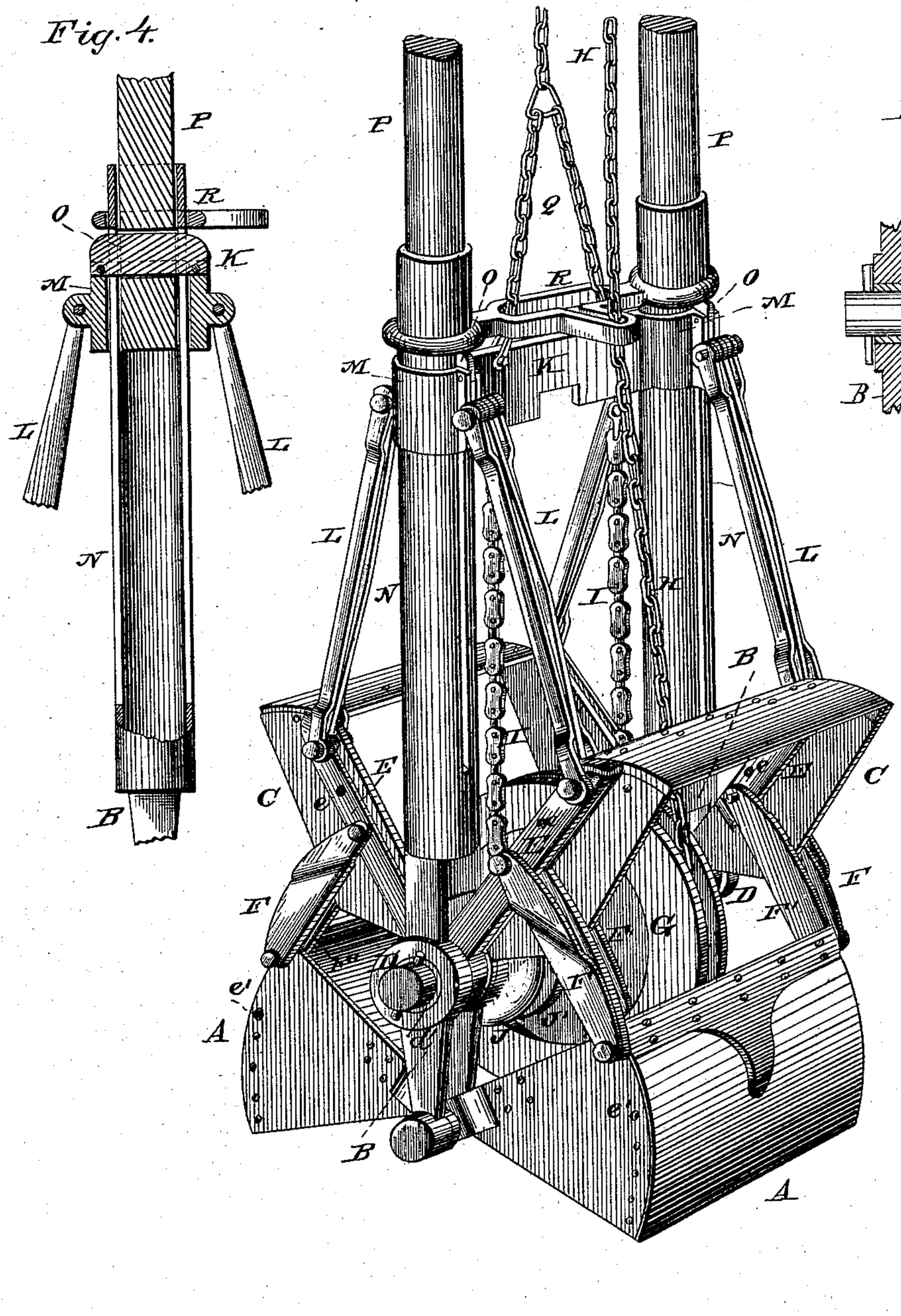
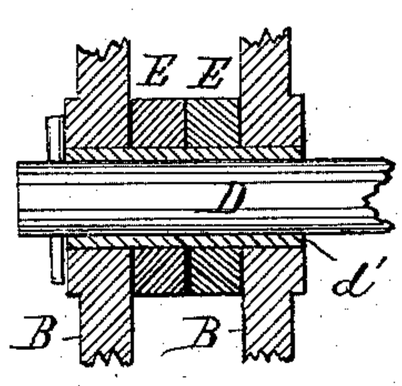


Fig. 4.

Fig. 5.



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(No Model.) 2 Sheets—Sheet 2.

W. A. T. SARGENT.

DREDGING BUCKET.

No. 263,230. Patented Aug. 22, 1882.

Fig. 2.

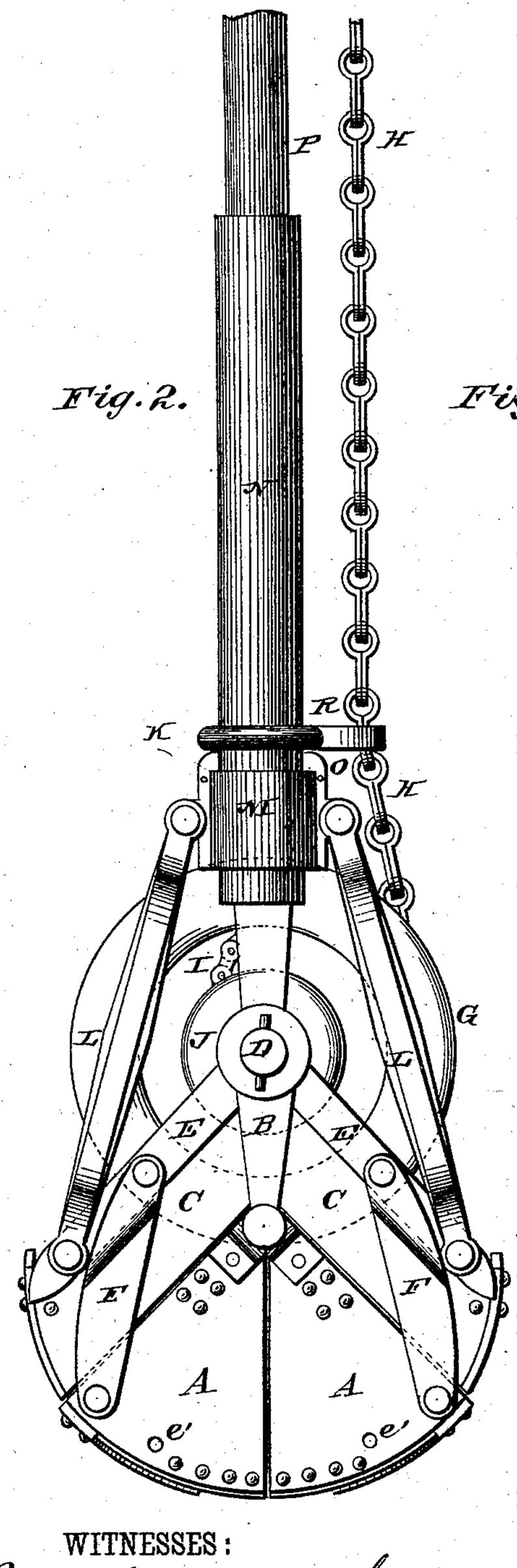
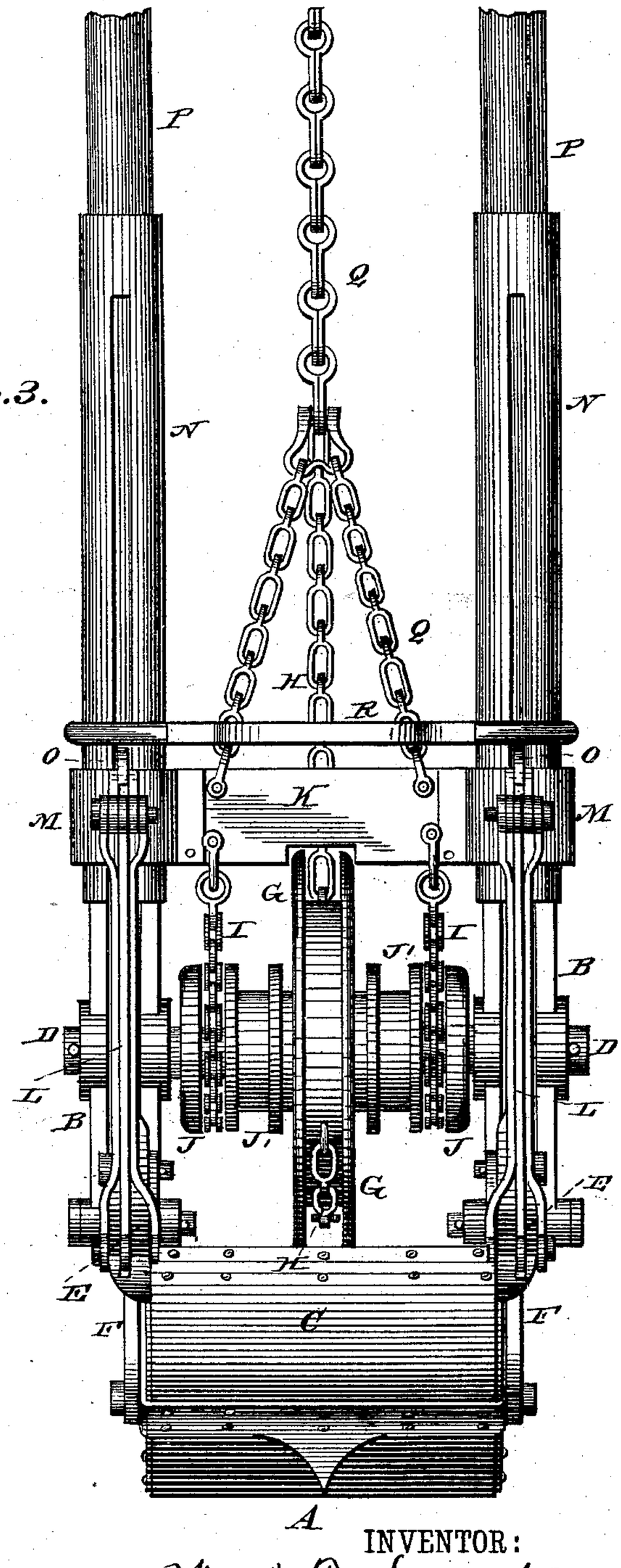


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM A. T. SARGENT, OF WILMINGTON, DELAWARE.

DREDGING-BUCKET.

SPECIFICATION forming part of Letters Patent No. 263,230, dated August 22, 1882.

Application filed April 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ALFRED TOBY SARGENT, of Wilmington, in the county of New Castle and State of Delaware, have invented a new and useful Improvement in Dredging-Buckets, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, forming part of this specification.

This invention relates to the class of dredging-buckets known as "clam-shell" buckets; and the invention consists in certain improvements in the construction of the bucket and means for operating the same, as hereinafter described.

In the accompanying drawings, Figure 1 is a perspective view of my improved dredging-bucket, showing it in position for descending. Fig. 2 is an end elevation, showing the bucket in position for ascending. Fig. 3 is a side elevation of the same, and Figs. 4 and 5 are detail sectional views.

Dredging-buckets of the clam-shell class have heretofore been constructed with two partially-cylindrical shells hinged together in such manner as to form a semi-cylindrical receptacle when closed. It is well known to experienced dredgers, however, that such a bucket is often extremely difficult to hoist out of the material in which it has been embedded, owing to the fact that it is adapted to cut and displace just material enough to clear its outer periphery when closed. In such a bucket, also, a comparatively small pulley must be used for closing the shells, because when the shells are opened their upper edges are brought nearer together, and the pulley, to avoid contact therewith, must be made correspondingly small, and consequently the closing-power which can be applied to such a bucket is necessarily less than that of a bucket adapted to accommodate a pulley of comparatively large diameter. I therefore construct the bucket with four shells instead of two, as will be seen by reference to the drawings, in which—

A A represent the two lower shells hinged in the slotted ends of the standards B B and C C, the two upper shells, hinged also in the slotted standards upon the shaft D, which is journaled in the said standards at a point above the hinges of the lower shells. The upper shells are hinged to the shaft D by means of ribs E, which are slotted longitudinally and provided with a series of perforations, *e*, in which the slotted arms F are pivoted to connect the upper with the lower shells, of which the latter are also provided with a series of perforations, *e'*, to admit of the adjustment of the arms F when it is desired to increase or diminish the cutting-power of the bucket. As the upper shells are hinged at a point above the hinges of the lower shells, the former, in order to be brought to a position to rest upon the upper edges of the latter, must necessarily be made of a greater radius than the latter, and as they therefore describe arcs of a greater circle than the lower shells describe they cut and displace sufficient material at the sides of the bucket to allow the water to pour in and prevent the formation of a vacuum when the bucket is being hoisted. In this manner the usual difficulty of hoisting a clam-shell bucket, due to suction, is prevented. As a result also of the radius of the upper shells being greater than that of the lower, a comparatively large pulley, G, can be placed upon the shaft D, whereby the closing-power of the bucket is greatly increased over all other clam-shell buckets hitherto in use. This pulley is provided with a chain, H, by which it is rotated to wind the chains I on the small pulleys J, which chains are connected to the cross-head K, by which the movements of the shells are controlled. The cross-head, which is connected to the upper shells by means of the pivoted arms L, is provided with sleeves M, which are adapted to slide on the tubular guides N. These guides are secured to the upper ends of the standards B B, and are slotted longitudinally on opposite sides to admit a key, O, which connects the sleeves M of the cross-head with the poles P. When the bucket is suspended by means of the chain Q, connected to the cross-head, and the chain H is paid out, the force of gravity causes the tubular guides N to sink through the sleeves of the cross-head, thus opening the shells and paying out the chains I. By the same movement the chain H is wound upon the pulley G, and when

power is applied to this chain to close the bucket through a bed of hard or compact material it is evident that the comparatively large diameter of the pulley G must greatly add to the power of winding the chains I on the small pulleys J. At the same time it is to be observed that the closing-power of the bucket does not depend entirely upon the pulley G and the chain H, as it would in a clam-shell bucket of ordinary construction. On the contrary, the entire weight of the poles P, which may be increased or diminished at pleasure, is superadded to the closing-power of the pulley G, for when power is applied to the chain H to wind the chains I on their respective pulleys, and thus draw the cross-head K down to close the shells, the weight of the poles, which are connected to the cross-head and adapted to slide in the tubular guides N, will tend to force the said cross-head down and close the shells with greatly-augmented power. With such a construction, when the material to be excavated is very hard the closing-power of the bucket may be increased to any desired degree by simply weighting the poles. As one course of chain is wound upon another on the pulleys it is evident that the large pulley will be wound full of its chain, while the small pulleys will be empty at the moment the bucket begins to close, and therefore, owing to the fact that the throw of the large pulley is increased by its wound chain, while that of the small pulleys is diminished by their chains being unwound, the greatest closing-power will be available at that instant, as is needed; also, when the bucket is closed the relative positions of the chains will be reversed, whereby the greatest opening-power will be available at the instant required.

The pulleys J are provided with deep grooves to increase the difference between their diameter and that of the large pulley, in order to obtain the greatest power possible for closing the bucket through hard material. By the side of pulleys J, I provide pulleys J′, having grooves of less depth, and I design that the chains I shall be shifted to pulleys J′ when the bucket is to be used in soft material. In this manner the closing-power of the bucket is diminished, as required in soft material.

As stated above, the arms F, connecting the upper with the lower shells, are made adjustable by means of perforations *e e′*, whereby the cutting-power of the bucket may be regulated according to the material to be cut. By moving the upper ends of these arms inward toward the shaft D the power is increased, and the power may be greatly decreased by moving them in the opposite direction, and also adjusting the lower ends of arms L nearer to the shaft D. The inside arms, F′, which are used when the greatest power is to be applied, may be omitted when the arms F are adjusted outward to diminish the power. By placing the arms L nearer to the shaft D the bucket can be closed much more rapidly, and thus it is adapted for very soft material. As a means of diminishing the friction of the shaft D, and to prevent rings or grooves from being cut therein, it is provided with a bearing-sleeve, *d′*, at each end, inclosing the journals thereof and supported in the slotted standards, so that the upper shells, C, shall form hinge-joints by means of the ribs E with the outer surface of these sleeves, instead of with the journals of the shaft, and the sleeves shall thus serve as intermediate bearings between the said shaft and the ribs E.

A sliding brace, R, may be used, if desired, to strengthen the tubular guides N and to serve as a guide for the chains H and Q.

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

1. A dredging-bucket having four shells connected together and arranged in pairs one above another, substantially as shown and described.

2. A dredging-bucket having two lower shells hinged together and two upper shells hinged together at a point above the hinges of the former, and connected to the former by arms, substantially as shown and described.

3. A dredging-bucket having two lower shells and two upper shells of greater radius than the lower, and hinged at a point above the hinges of the lower, substantially as shown and described.

4. The combination, with the lower shells hinged together and supported in standards, of the upper shells hinged together and supported in the standards at a point above the hinges of the lower, and connected to the lower by adjustable arms, substantially as shown and described.

5. The combination, with the lower shells, the standards supporting the latter, and the shaft carrying the pulleys, of the upper shells hinged to the said shaft, and connected to the lower shells and to a sliding cross-head by adjustable arms, substantially as shown and described.

6. The combination, with the slotted standards and the shaft carrying the pulleys, of the bearing-sleeves inclosing the journals of the shaft, and the upper shells connected to the outer surface of the sleeves and adapted to rotate thereon, substantially as shown and described.

7. The combination of the tubular guides with the bucket secured thereto, the poles sliding therein, and the cross-head connected to the poles, substantially as shown and described, whereby the weight of the poles shall be superadded to increase the closing-power of the bucket, as set forth.

8. The combination, with the shells and the pulleys and their supporting-standards, of the tubular guides secured to the standards, the cross-head connected to the pulleys and the

upper shells, and the poles having their lower ends secured to the cross-head by keys passing through longitudinal slots in the tubular guides, substantially as shown and described.

9. The combination, with the shells, the cross-head, and the tubular guides, of the two sets of small pulleys, the chains for connecting either set at will to the cross head, and the large pulley carrying the closing-chain, said parts being adapted to operate substantially as in the manner specified.

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Witnesses:
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