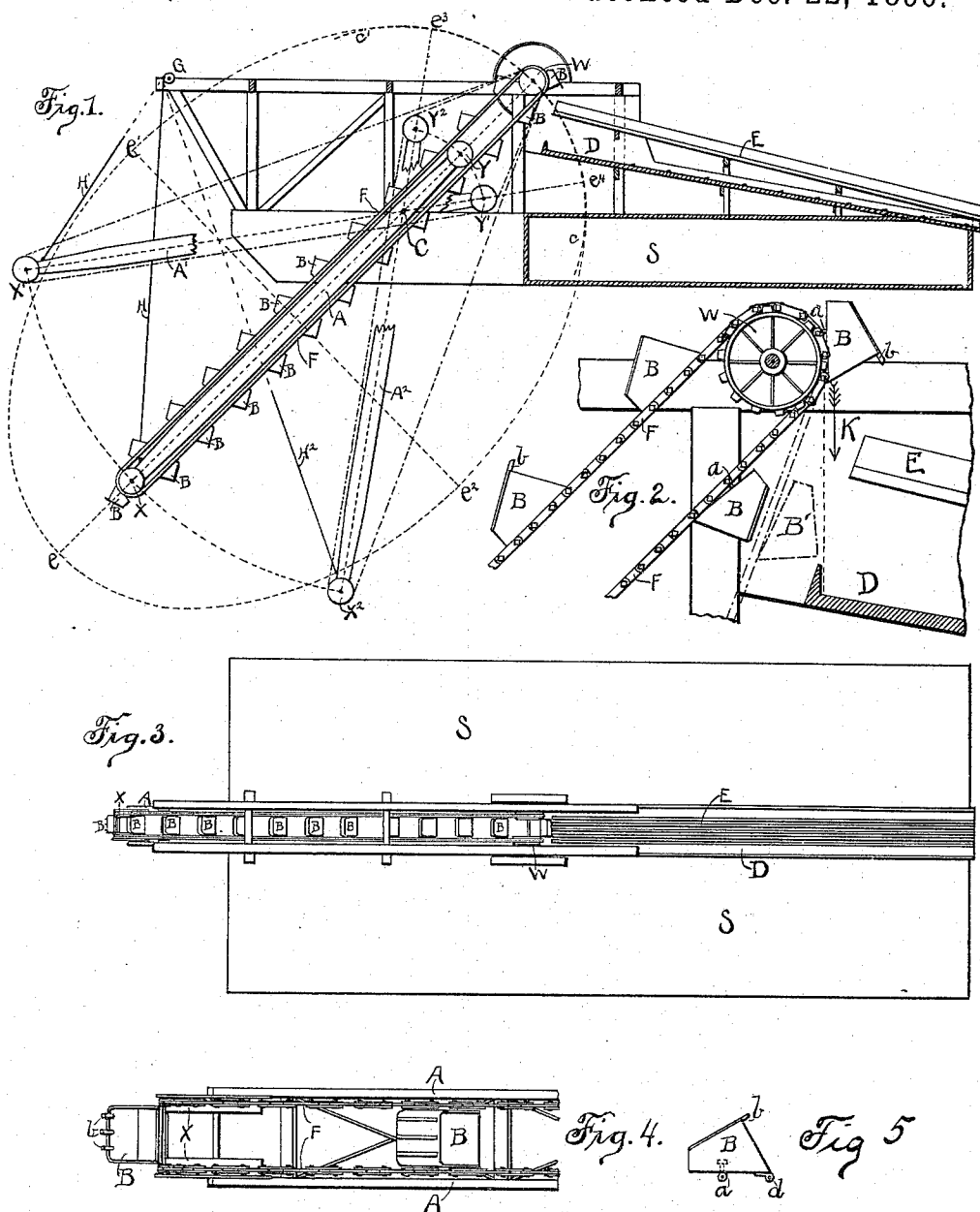


(No Model.)

C. H. OLSON.
DREDGING MACHINE.

No. 573,832.

Patented Dec. 22, 1896.



WITNESSES:

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C. H. OLSON GOLD DREDGER COMPANY.

DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,832, dated December 22, 1896.

Application filed May 11, 1896. Serial No. 591,015. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER H. OLSON, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented a new and useful Improvement in Gold-Dredging Machines, of which the following is a concise, clear, and full description, reference being made to the accompanying drawings, forming a part of this specification.

My invention relates to floating dredging-machines, and has for its object the working of gravel-beds and sand-bars along the beds of rivers, shores of lakes, bays, and other bodies of water where gold and other precious metals may be deposited in placer form. I attain this object by a series of dredging-buckets carried on a chain belt that is driven by a fixed sprocket-wheel at the top, and the lower part of the belt is carried on a swinging pulley-beam so pivoted that the lower end of the chain may be raised or lowered to dredge any depth desired without causing the belt to become slack or taut, and also to cause the belt at all times on its downward course from the driving-wheel to be inclined, so as to cause the buckets to dump their contents with a clear vertical fall into the sluice-box.

My invention will be more clearly understood by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal section of a scow on which the dredger is placed and the chain belt and the swinging pulley-arm are shown. Fig. 2 is an enlarged view of the sprocket driving-wheel where the buckets are emptied into the sluice-box. Fig. 3 is a top view of the scow and dredger. Fig. 4 is an enlarged top view of one end of the swinging pulley-arm with the chain belt and buckets in place. Fig. 5 is a side view of one of buckets detached from the chain belt and shows more clearly the eyebolts *a* and eye-pieces *d*, through which the buckets are bolted to the belt-chain.

The principal part of my invention consists of the pulley-arm A, which may be of any length according to the desired depth capacity of the dredger. This lever-arm is provided with pulleys or drums X and Y at each end, on which the chain belt F is to work freely.

The arm being placed at an angle of about forty-five degrees, (45°), as shown in Fig. 1 at X Y, the sprocket W is set in line with it at sufficient height to secure ample space to empty the buckets into the sluice-box D. This being determined, the distance from center to center of X and Y is taken as the minor diameter of an ellipse of which the center of W is taken as one end of the major diameter. An ellipse *e, e', e², e³, and e⁴* is constructed on the two diameters thus obtained, and a point, as C, in the arm A in line with the centers of X and Y is found which will be the center of a circle whose arc will most nearly coincide with the end curve of the ellipse, as shown at *c c'*. The arm is then firmly pivoted at this point C and the chain belt fitted in place so as to work freely on the sprocket-wheel W and the pulleys X Y, all wheels having the same diameter.

From the geometrical fact that every point in the ellipse occupies a position equal to the sum of the distances from the foci, which in this case are the centers of X and Y, it is evident that should W be moved to any point in the ellipse from *e³* to *e⁴* the chain belt F would run with equal ease in all positions. This being true, it is also evident with W in the fixed position the pulley-arm A, being pivoted at C, may be swung from the position shown at X' Y' to that shown by X² Y² and the chain belt will work with equal freedom, as at X Y. This is not only true geometrically, but actual measurements practically verify the statement. By means of this swinging arm pivoted in this way the chain of buckets may be operated so as to dredge at any depth from X' to X², and at all times the downward movement of the chain from W to Y' or to X² is so inclined that the sluice-box D will be under W far enough to catch all the material dumped from the buckets, as more clearly shown at K, Fig. 2, and the empty buckets will pass downward clear of interference, as seen at B'.

The arm A is held in any position desired by the cable H, which is operated over the pulley G. In the several drawings the buckets are indicated by B. It will be observed they are hung between the two chains of the belt by means of long bolts put through the eyes *a*

and d , as indicated in Fig. 4. The bolt a fits loosely, so as to let the buckets work freely about the pulleys. The bolts pass through the eyes of the chain-link, and thus unite the chains, so as to form a complete double belt. It is to be observed that each alternate bucket is provided with teeth b , that loosen up the gravel and other deposits, which are cleanly taken up by the following smooth-rimmed bucket.

The scow S is constructed with a slip in the front end, in which the arm A is operated. The dredger is operated by a steam-engine and is otherwise than above described constructed and operated as other machines of this character. The larger rocks are separated from the finer gravel by means of an incline grating E , which allows the finer gravel and other material to fall into the sluice-box below it.

I am aware that previous to my invention various forms of bucket-chain dredges have been used for general dredging work, all of which cannot be used effectively in working placer-beds, they not being adapted to varying depths nor arranged with a dump directly over the sluice-box. I therefore do not make any claim on a bucket-dredger in a broad or abstract sense; but,

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

1. In a dredging-machine, the combination with a driving-shaft carrying sheaves and a chain of buckets, of a swinging beam provided with pulleys or sheaves at its ends and pivotally mounted at such a point between

its ends that, at whatever deflection of the beam from a line drawn through the shafts of its sheaves and the driving-shaft, the bucket-chains will be taut and will present a triangular figure, as set forth.

2. The combination of the pulley-beam pivotally mounted as described, the chain of buckets and driving-sheaves mounted as set forth, of the sluice D located upon the boat adjacent to the downward run of the chain, with or without the screen as set forth.

3. In a dredging-machine, the combination of the pivoted lever-arm A having pulleys X and Y , whose centers occupy the position of the foci of an ellipse, when in line with a sprocket-wheel W whose center occupies the end of the major diameter, said arm pivoted at a point A that will be the center of a circle a quadrant of whose arc will most nearly coincide with the end curve of the ellipse, said arm and wheel being provided with a belt-chain F and buckets B , each alternate bucket having teeth all mounted and used in combination with a scow S , the inclined grating E and the sluice-box D all so constructed that the downward movement of the belt will be on such an incline that the sluice-box will be wholly beneath the buckets when dumping, all substantially as described and for the purposes set forth.

In witness whereof I hereunto subscribe my name this 5th day of May, 1896.

CHRISTOPHER H. OLSON.

Witnesses:

A. G. AVERY,

L. J. SAUNDERS.