No. 646,532. Patented Apr. 3, 1900.

S. BABARE.

DRILL GOLD DREDGE.

(Application filed May 22, 1899.)

(No Model.) 2 Sheets—Sheet 1.

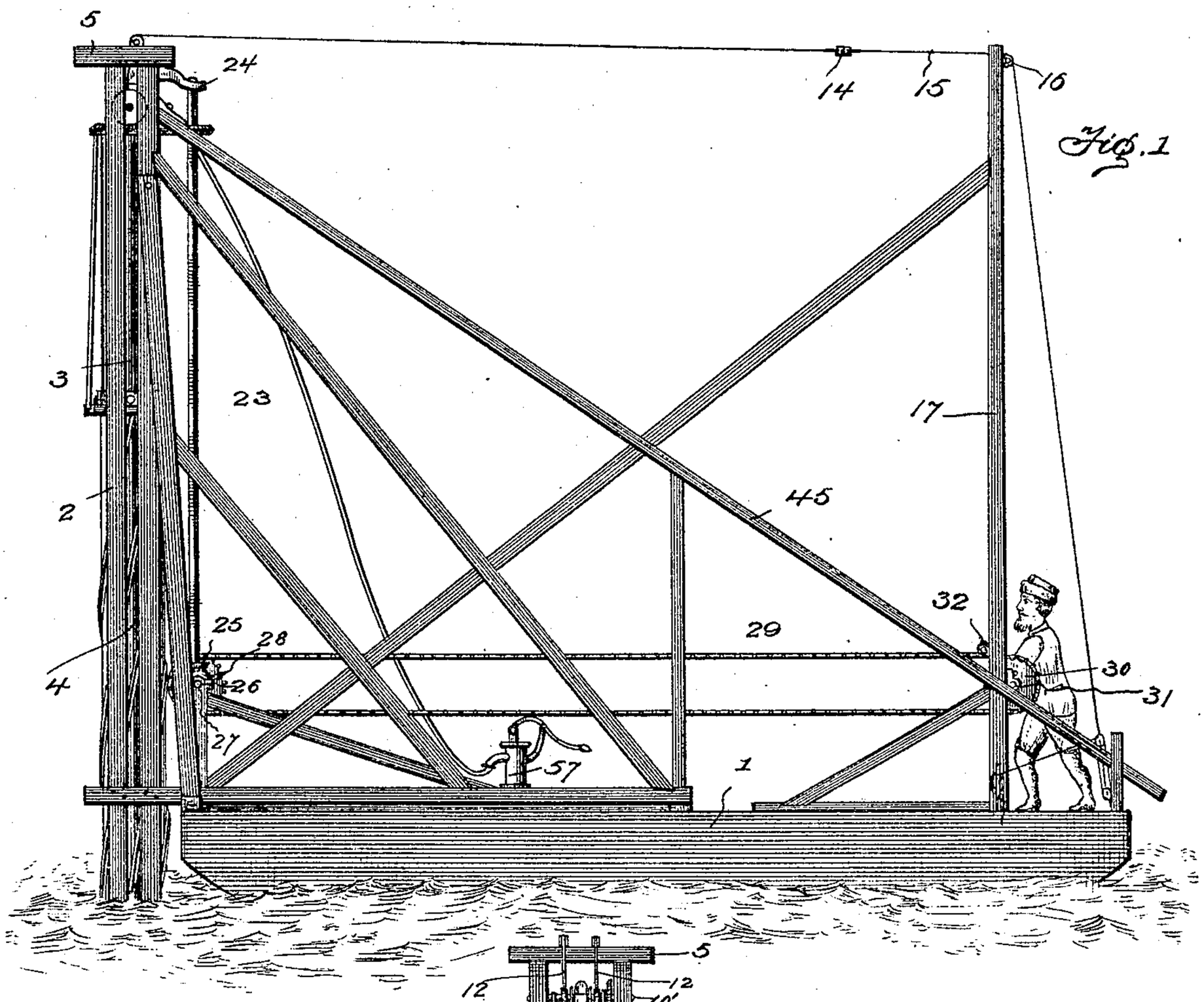

Fig. 1.

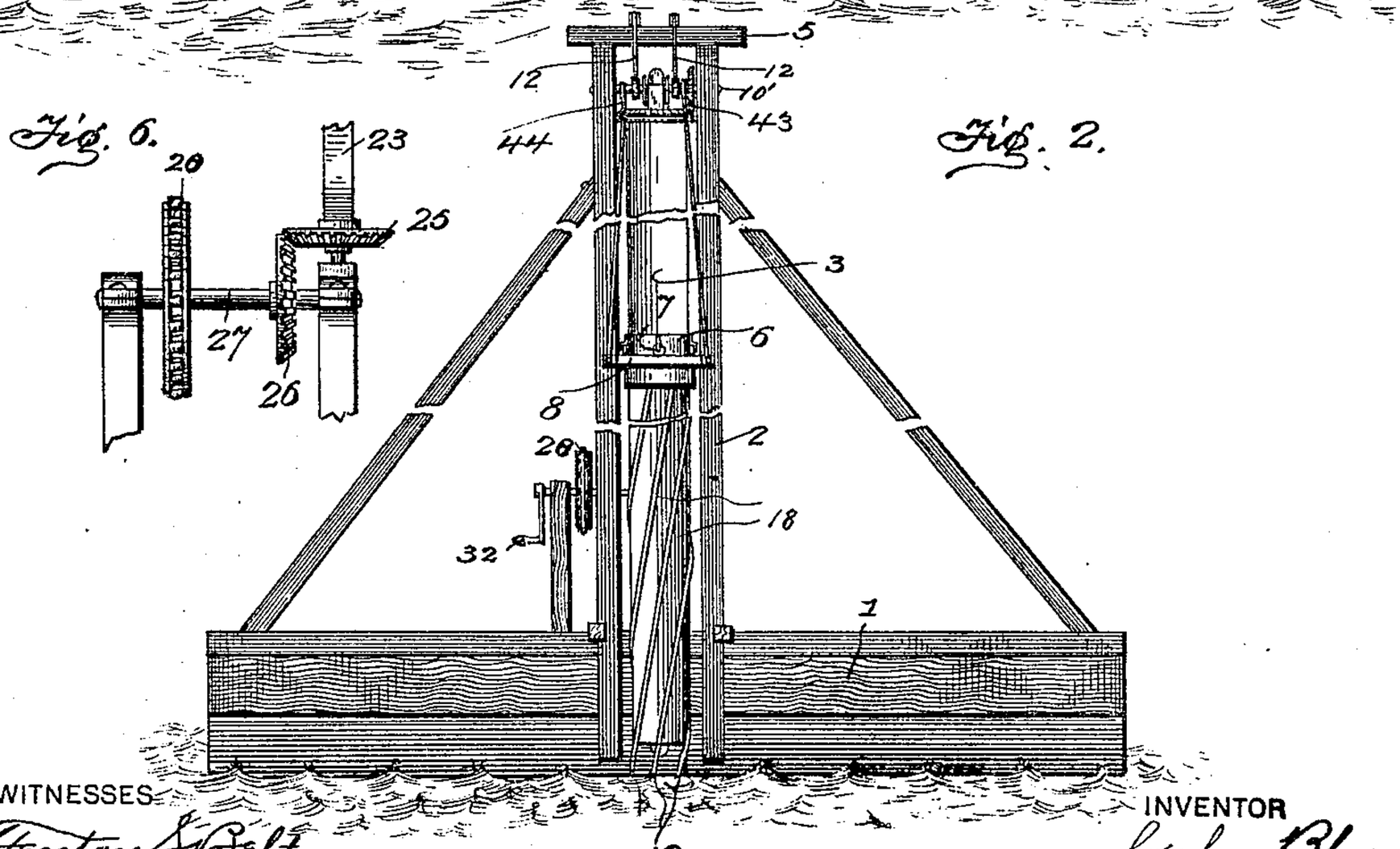

Fig. 2.

Fig. 6.

WITNESSES

Fenton S. Belt.

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Fig. 3.

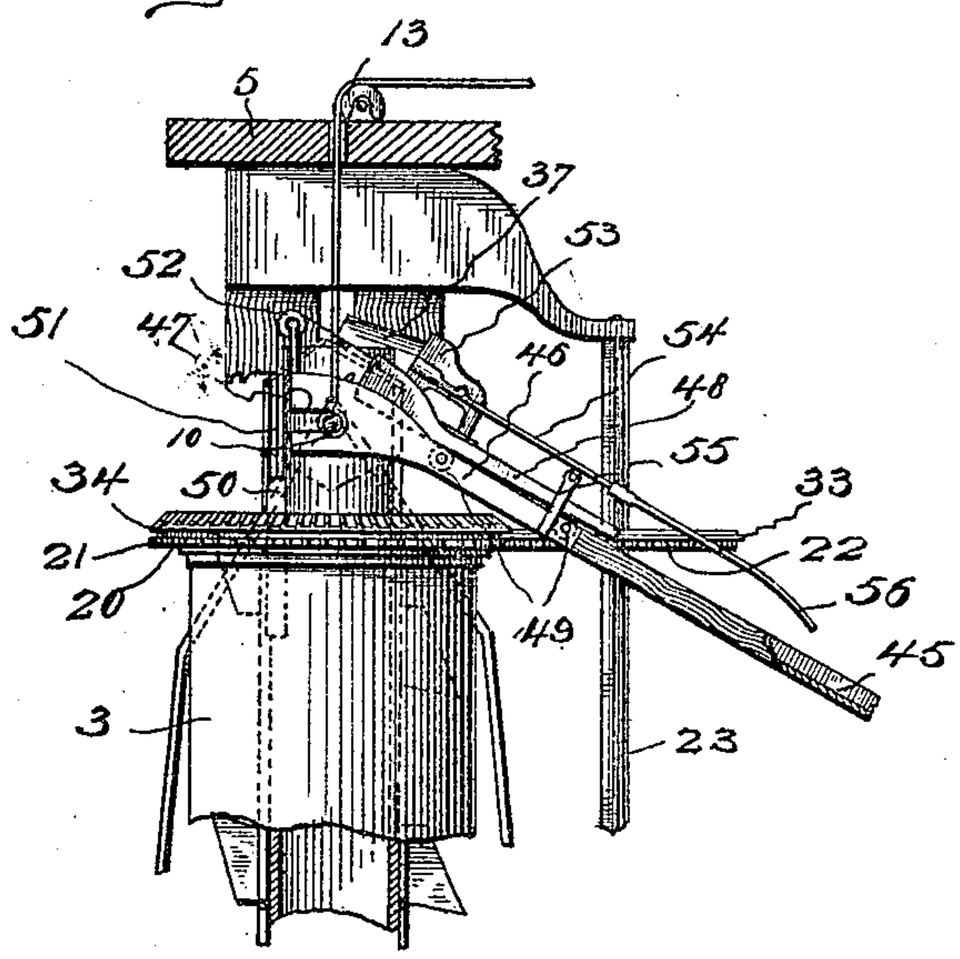


Fig. 4.

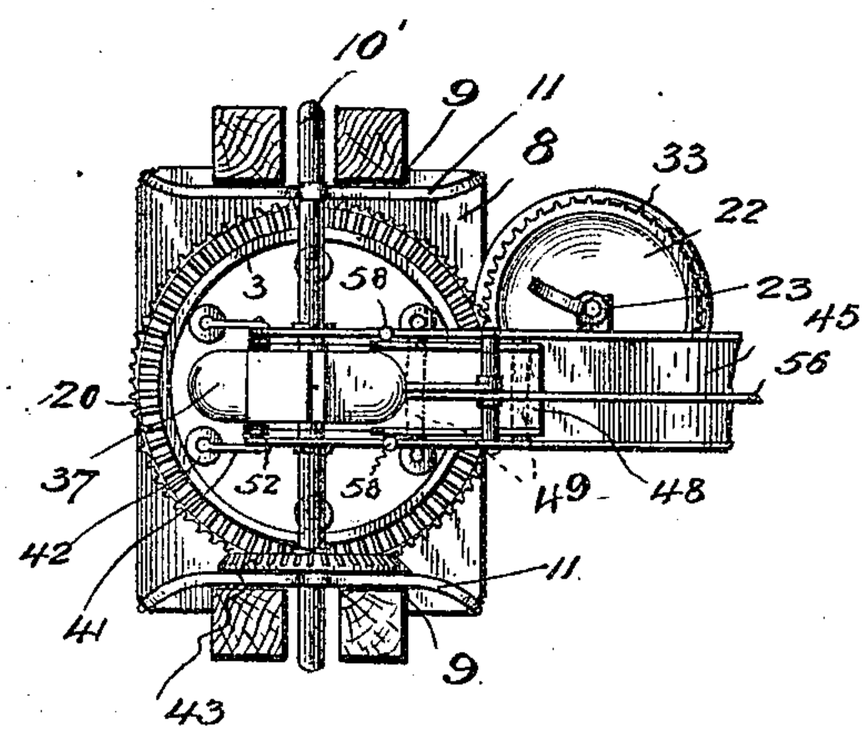
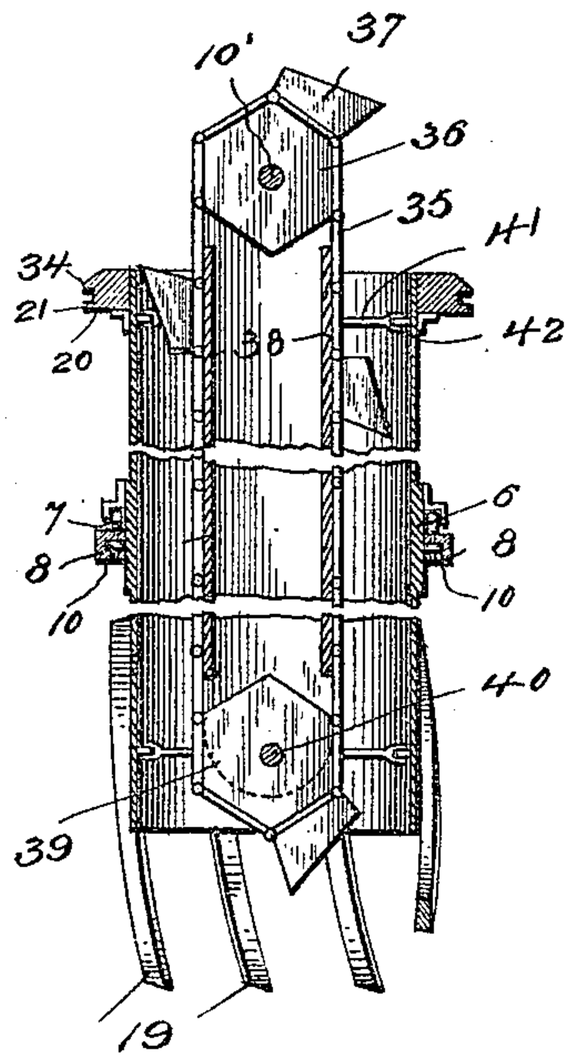


Fig. 5.



WITNESSES

Fenton S. Pelt.

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STEFANO BABARE, OF TACOMA, WASHINGTON.

DRILL GOLD-DREDGE.

SPECIFICATION forming part of Letters Patent No. 646,532, dated April 3, 1900.

Application filed May 22, 1899. Serial No. 717,843. (No model.)

To all whom it may concern:

Be it known that I, STEFANO BABARE, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Drill Gold-Dredges; and I do hereby 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.

My invention relates to improvements in dredging-machines, and particularly to that class of drill-dredgers which are adapted for use in dredging the bottoms of rivers or other bodies of water in order to obtain precious metals therefrom, particularly gold.

It consists in a dredger comprising a float or scow, an upright revolving cylinder suitably supported thereon, means for raising and lowering the cylinder, means for communicating a rotating movement to the cylinder, and a conveyer mounted in the said cylinder for lifting the dredged material from the bottom of the body of water and depositing the same in any suitable sluice-box.

It also consists in a dredger formed of a supporting-scow, a vertically-moving rotating cylinder, gearing connecting said cylinder with a sliding gear on a vertical shaft, means for communicating power to the said shaft for rotating the gearing and cylinder, an endless conveyer mounted in the said cylinder and adapted to hoist material from the bottom of any body of water and deposit the same in the sluice-box, and means for washing out the buckets of the conveyer and supplying water to the sluice-box.

My invention further consists in certain other novel constructions, combinations, and arrangements of parts, as will be hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of a dredging-machine constructed in accordance with my invention. Fig. 2 represents an end elevation of the same. Fig. 3 represents a detail view in elevation of the upper portion of the cylinder and its adjoining parts, portions of the framework being broken away. Fig. 4 represents a detail horizontal sectional view above the upper end of the cylinder, the gearing for operating the said cylinder being shown in elevation. Fig. 5 represents a detail vertical sectional view through the said cylinder, portions of the cylinder being broken away. Fig. 6 is a detail fragmentary view of a part of the gearing for communicating a rotary motion to the dredging-cylinder.

My improved dredger belongs to that class of devices which are adapted to be moved from place to place upon rivers or other bodies of water and to be anchored or secured at any desired point for dredging the bottom of the water.

1 in the drawings represents a scow or float of any suitable construction for supporting the dredging apparatus, and 2 a standard or vertical guide, between the members of which a vertical cylinder, as 3, is supported. The standard 2 is preferably erected at one end of the scow 1 and is formed of side members having guiding-slots, as 4, formed therein from top to bottom. The members of the standard 2 are preferably connected at the top by a cross-piece or platform, as 5, and is thoroughly braced with respect to the scow, as illustrated in the drawings. Mounted between the members of the standard 2 is a vertically-moving rotatable cylinder 3. The cylinder 3 is provided about midway of its length with a thickened portion or belt 6, which carries a series of friction-rollers 7. The rollers 7 are adapted to rest upon the edges of a platform or supporting-block 8, which surrounds the cylinder and is provided in its opposite ends with notched or cut-out portions, as 9 9, which engage the outer edges of the standard members. The block or platform 8 is thus held in proper position and may be moved vertically with respect to the said standard. The platform 8 has antifriction-rollers 10 interposed between it and the periphery of the belt 6, so as to prevent friction between the cylinder and the said platform. Inasmuch as the rollers 6 rest upon the platform 8, it will be perceived that the said platform supports the weight of the cylinder. The platform in turn is suspended from a shaft 10 by means of metal straps or hangers 11 11, arranged on each side of the cylinder 3. The shaft 10 extends at its ends into the guide-slots 4 of the standard 2. The shaft 10 is movably supported in the said cylinder by being journaled in the ends of the suspend-

ing cables or ropes 12 12, said cables passing upwardly through openings in the top piece 5 and over bearing-rollers 13 mounted thereon. The cables 12 then pass rearwardly over the scow 1 and are attached to a cross-piece 14, which is secured at its central portion to the end of a lifting rope or cable 15. The cable 15 passes about a pulley or roller 16 at the upper end of a standard 17 and thence downwardly to the scow, where it may be secured in place and be within reach of an operator, as occasion may require. It will be noted that by releasing the cable 15 the shaft 10 and the cylinder which it supports may be lowered with respect to the scow, the lower end of the cylinder extending into the water and reaching to the bottom which is to be dredged. When it is desired to move the scow or cease the dredging operation, the cable 15 is again pulled in and secured, thus lifting the dredging-cylinder out of the water.

The lower portion of the cylinder 3 is preferably provided with external ribs or projections, as 18, which are preferably spirally arranged upon the cylinder and project a suitable distance below the lower end thereof, so as to form digging-points, as 19, as clearly illustrated in Fig. 5 of the drawings. It will be seen that when the cylinder is lowered to the bottom of a body of water and rotated the points 19 will stir up the material of the bottom and so loosen it as to enable it to be raised by a suitable elevator or conveyer, as will be hereinafter more fully described.

In order to rotate the cylinder 3, it is provided at its upper end with an externally-arranged collar 20, having a spur-gear 21 formed thereon, which is adapted to mesh with a corresponding spur-gear 22. The spur-gear 22 is provided with a central squared aperture, which is adapted to slip upon a squared shaft, as 23, which extends from a bearing 24 at the top of the standard 2 to a suitable supporting-bearing upon the scow. It will be apparent, of course, that the same object can be accomplished by splining the said spur-gear 22 upon a shaft which is round or any other shape, if desired, without departing from the spirit of my invention. To the lower end of the shaft 23 a bevel-gear, as 25, is secured, which meshes with a corresponding bevel-gear 26, rigidly mounted upon a horizontal shaft 27. The shaft 27 finds suitable bearings upon the standards on the scow 1 and carries an actuating sprocket-wheel 28, which is connected, by means of a sprocket-chain 29, with a sprocket-wheel 30, secured to a power-shaft 31. The power-shaft 31 may be operated by any suitable means—as, for instance, by the application of mechanical power, or it may be operated by hand-power, as illustrated in the drawings, a crank 32 being secured to the said shaft for this purpose. It will be noted that by operating the power-shaft 31 the connecting-gearing will communicate motion therefrom to the vertical shaft 23, which in turn will, through the spur-wheel 22, actuate and rotate the cylinder 3. The shaft 23 is squared, so that the spur-wheel 22 may slide up and down upon the same to adapt itself to different positions of the cylinder 3 and in order to hold the said spur-gear 22 always in engagement with the spur-gear 21, said former gear being provided with a projecting annular rib, as 33, which runs in a groove 34, formed in the collar 26 at the upper end of the cylinder 3. By this simple contrivance the spur-gears will always be kept in mesh no matter whether the cylinder be raised or lowered.

The cylinder 3 is preferably hollow, as illustrated, in order to accommodate an endless conveyer, as 35, which operates therein. The conveyer 35 consists, preferably, of an endless chain supported upon a pulley 36, mounted upon the shaft 10 about centrally thereof. The pulley 36 is preferably hexagonal in shape, each face of the said pulley engaging a link of the conveyer-chain 35. At suitable intervals the chain is provided with dredging-buckets 37 for lifting the material from the bottom of the body of water where the dredging is taking place. The conveyer-chain is made of sufficient length to extend to the lower edge of the cylinder 3, the buckets carried thereby projecting below the same between the points 19 of the ribs 18, as clearly seen in Fig. 5 of the drawings. In order to hold the chain of the conveyer in proper position, a central boxing, as 38, is mounted between the upwardly and downwardly moving parts of the said chain, said boxing being hung from the shaft 10. The boxing carries at its lower end a second pulley 39, around which the conveyer-chain passes at its lower end. This pulley 39 is also preferably made hexagonal in shape and is mounted upon a shaft 40, which is journaled in the boxing 38. In order to prevent the buckets 37 from scraping against the sides of the cylinder, the guiding-housing 38 is provided with outwardly-extending arms 41 41, which carry antifriction-rollers 42 at their outer ends, said antifriction-rollers being adapted to engage the inner surface of the cylinder. By means of these arms the housing is preferably spaced in the center of the rotating cylinder 3.

In order to actuate the conveyer-chain 35, the shaft 10 is rotated, and in order to receive a rotating movement it carries a bevel-gear 43, which meshes with a bevel-gear 44, formed on the upper surface of the collar 20, as clearly seen in Figs. 3 and 4 of the drawings. It will thus be seen that when the cylinder 3 is rotated motion will be communicated through the bevel-gears 43 and 44 to the shaft 10 for actuating the conveyer-belts simultaneously.

In order to properly receive the contents of the buckets 37 and carry them to a suitable point, I mount a sluice-box, as 45, in a suitable position for this purpose. The sluice-box is provided at its upper end with side projecting arms, as 46 46, each of which is bi-

furcated at its outer ends, as at 47, so as to engage the shaft 10, upon which they rest. In order to better receive the material from the buckets 37 and direct it properly into the sluice-box 45, I mount a short sliding sluice-box 48 at the upper end of the said sluice-box 45. The sliding box 48 is mounted upon the rollers 49 49, which are pivoted between the arms 46 46 at the upper end of the box 45. The said sluice-box is held in position against lateral movement by means of antifriction-rollers 58 58, mounted upon the upper edges of the arms 46 46. The sliding sluice-box 48 is normally held in its uppermost position by means of weights 50, which are secured to the said sliding sluice-box by means of cords, as 51, which pass over rollers 52, mounted upon the upper ends of the arms 46. The sliding sluice-box is thus held normally in close proximity to the conveyer-chain. A bracket 53 is mounted upon the top of the sliding sluice-box 48, the said bracket being adapted to be engaged by the buckets 37 as they move around the pulley 36, whereby the sliding sluice-box will be gradually pushed back as the buckets begin to descend. As soon as the bucket passes the sliding sluice-box will again resume its position close to the conveyer-chain. By this construction the sluice-box 48 will catch all of the material from the buckets as they come around.

In order to wash material that might cling to the sides of the bucket, I pivotally mount a pipe, as 54, upon the bracket 53, one end of the said pipe being flush with the front end of the bracket 53, so as to discharge water back into the buckets, while the other end extends downwardly and is adapted to move back and forth upon the roller 55, mounted above the sluice-box. The lower end of the pipe 54 is connected by means of a flexible tubing, as 56, with a pump, as 57, upon the scow 1. This device enables me not only to flush the buckets and clean them out, but to supply a sufficient amount of water to the sluice-boxes to feed the material forward in them.

When it is desired to use my improved dredger, the scow is moved to any suitable position and anchored or otherwise securely held in place, after which the cylinder 3 is lowered, through the instrumentality of the cable 15, until its lower end touches the bottom. Then by operating the power-shaft 31 31 the cylinder is set in rotation, and at the same time the endless conveyer begins to operate to lift the material thus stirred up and empty it into the sluice-box. The pump may be operated at any time when it is desired to more completely empty the buckets and facilitate the movement of the material dredged in the sluice-boxes.

It will be observed that my improved dredger is simple in construction and yet capable of easy manipulation. I contemplate constructing such a dredger in smaller sizes, if desired, so that hand-power may be used for operating them, while, upon the other hand, they may be constructed larger and operated by any desired mechanical means, all within the spirit of my invention. A device of this kind is particularly adapted for dredging the bottoms of rivers and other bodies of water where gold-bearing sand and material are found.

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

1. In a dredger, the combination with a suitable float of a standard mounted thereon, a vertically-adjustable rotating cylinder moving in the said standard, a horizontal shaft secured to said cylinder, cables for supporting the said shaft, whereby the cylinder may be raised or lowered as required, and means for imparting a rotary movement to the cylinder for stirring up the bottom of the bodies of water operated in, substantially as described.

2. In a dredger, the combination with a suitable float, of a standard mounted thereon, a vertically-moving cylinder mounted in the said standard, said cylinder having antifriction-rollers secured to its sides, a platform for supporting the said rollers, a horizontal shaft supporting said platform, and means for raising and lowering the said inner edge of the platform, whereby the cylinder will be adjusted to different heights, substantially as described.

3. In a dredger, the combination with a suitable float or scow, of a standard arranged at one end thereof, a vertically-movable cylinder guided in its motion by the said standard, a shaft supporting the said cylinder, cables secured to the said shaft and running over suitable pulleys whereby the shaft may be raised or lowered from the deck of the scow, and gearing arranged upon the scow and connected with the cylinder for rotating the same, substantially as described.

4. In a dredger, the combination with a scow, of a vertically-movable cylinder mounted thereon, a gear-wheel secured to the said cylinder, a sliding gear meshing therewith, a squared shaft for receiving the said sliding gear and imparting movement thereto, and means for rotating the squared shaft, whereby a rotating movement may be imparted to the cylinder when in its raised or lowered position, substantially as described.

5. In a dredger, the combination with a float, of a dredging-cylinder mounted thereon, said cylinder having a series of projecting ribs on its lower portion, the ribs extending below the ends of the cylinder to form digging-points, gearing for rotating the said cylinder, comprising a spur-gear upon the upper end of the cylinder, a spur-gear meshing therewith and sliding upon a squared shaft, said latter gear having a peripheral projection adapted to engage a peripheral groove upon the cap-piece of the cylinder, whereby the two gears will be kept together when the cylinder is raised or lowered, means for rotating said squared shaft, and means for rais-

ing and lowering the said cylinder, substantially as described.

6. In a dredger, the combination with a suitable float, of a vertically-moving dredging-cylinder mounted thereon, gearing mounted on the dredging-cylinder meshing with gearing movably mounted upon a vertical shaft, means for rotating the said vertical shaft for imparting movement to the cylinder, comprising bevel-gearing connected to the lower end of the said shaft, a sprocket-wheel for moving the said gearing, and a sprocket-chain for connecting the said sprocket-wheel with a power-shaft, whereby the cylinder may be rotated from the deck of the scow, substantially as described.

7. In a dredger, the combination with a suitable float, of a hollow dredging-cylinder mounted thereon, means for raising and lowering the said cylinder, and means for rotating the same and a conveyer-chain mounted in the hollow cylinder adapted to raise the material stirred up by the rotation of the cylinder, substantially as described.

8. In a dredger, the combination with a suitable float, of a vertically-adjustable rotatable hollow dredging-cylinder, an endless conveyer-chain mounted in the said hollow cylinder, said chain having buckets for lifting the material, pulleys carrying the said chain, a shaft for actuating the said pulleys, a bevel-gear on the said shaft, and a bevel-gear on the top of the rotating cylinder for meshing with and actuating the bevel-gear on the said chain, the construction being such that when the cylinder is rotated the conveyer-chain will be operated to lift the material dug or loosened by the rotating of the cylinder, substantially as described.

9. In a dredger, the combination with a suitable float, of a digging-cylinder mounted thereon, an endless conveyer-chain moving interiorly of the said cylinder, a guiding-boxing for directing the movement of the said chain, and arms secured thereto having anti-friction-rollers for preventing the conveyer-chain from coming in contact with the said cylinder, substantially as described.

10. In a dredger, the combination with a digging-cylinder and an elevating-carrier, of a sluice-box for receiving material therefrom, said sluice-box having arms engaging a shaft at the upper end of the cylinder, a sliding sluice-box mounted upon the upper end of the said sluice-box, and weights for holding the said sliding sluice-box in its uppermost position, substantially as described.

11. In a dredger, the combination with a suitable float of a digging-cylinder and an elevating-conveyer suspended from a suitable shaft, a sluice-box having bifurcated arms at its upper end for engaging the said shaft, rollers mounted between the said arms, a sliding sluice box adapted to move on said rollers, means for keeping the said sliding sluice-box in its upper position, a bracket secured to the said sluice-box, the construction being such that as the buckets of the conveyer travel in their customary path, they will engage the said bracket and push the sliding sluice-boxes sufficiently far to permit the buckets to pass after discharging their contents, substantially as described.

12. In a dredger, the combination with a suitable float, of a digging-cylinder and a conveying-elevator, of a sluice-box mounted thereon, the upper end of the said sluice-box being provided with a sliding sluice-box, a bracket carried by the said sliding sluice-box, a pipe pivoted to the said bracket at one end and sliding upon a roller at the other end, a flexible tubing connecting the said pipe with a pump, the construction being such that water may be forced into the buckets for loosening all material therein and sufficient water may be supplied to the sluice-boxes, substantially as described.

13. In a dredger, the combination with a suitable float, of a digging-cylinder and an elevating-carrier mounted thereon, a sluice-box for receiving material from the same, a sliding sluice-box mounted at the upper end of the main sluice-box, said sliding sluice-box moving upon rollers mounted at the upper end of the main sluice-box, antifriction-rollers for preventing the lateral movement of the said sliding sluice-box, and means for holding the said sluice-box normally in its upper position, substantially as described.

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

STEFANO BABARE.

Witnesses:
PETER DAVID,
F. CAMPBELL.