

T. BARNETT.

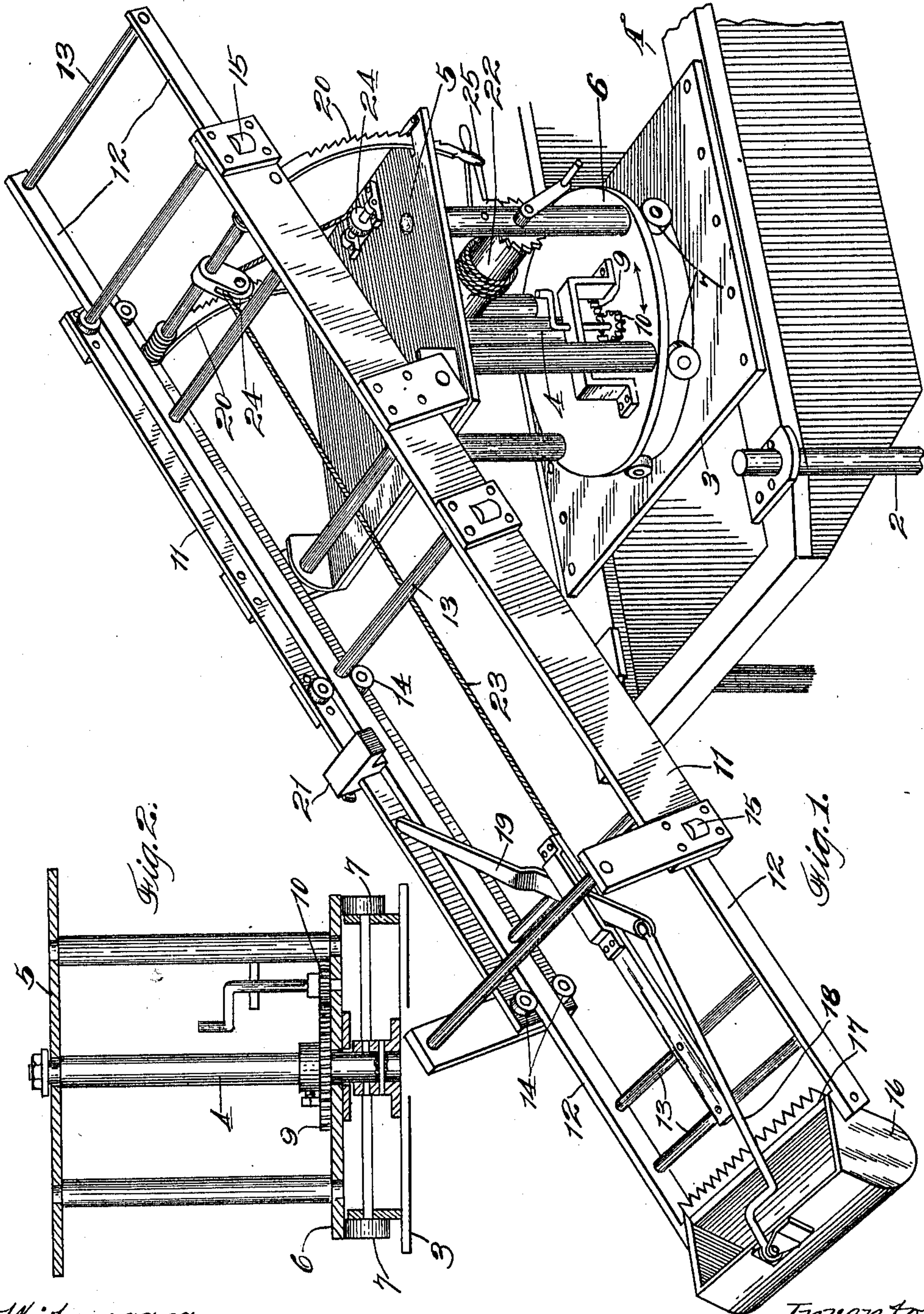
DREDGER.

APPLICATION FILED SEPT. 13, 1909.

Patented Dec. 13, 1910.

2 SHEETS-SHEET 1.

978,540.



Witnesses:

A. C. Maynard.  
R. S. Burns.

Inventor:  
Thomas Barnett;  
By G. H. Strong  
his Atty.

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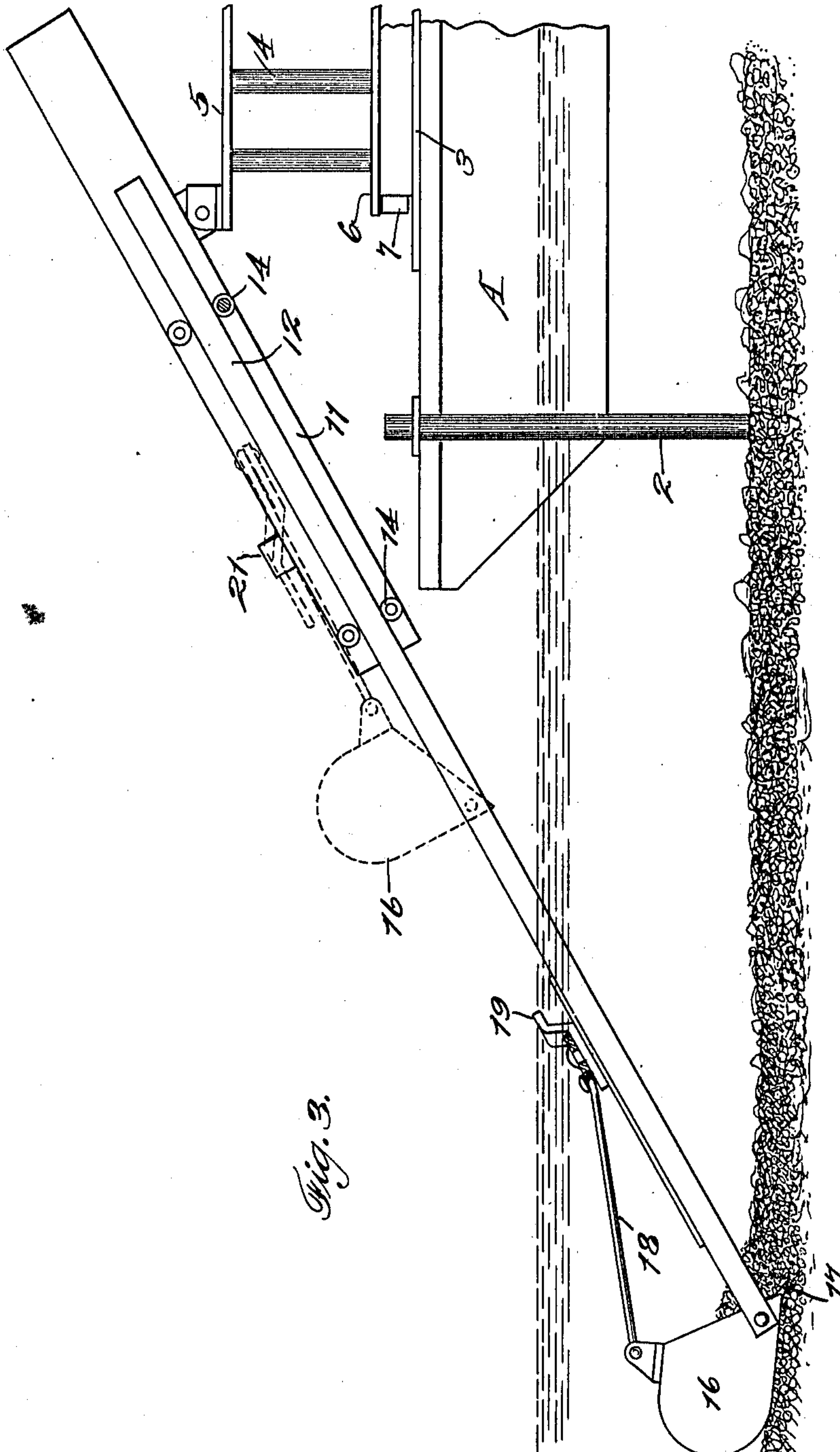


Fig. 3.

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# UNITED STATES PATENT OFFICE.

THOMAS BARNETT, OF SAN FRANCISCO, CALIFORNIA.

## DREDGER.

978,540.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed September 13, 1909. Serial No. 517,474.

### *To all whom it may concern:*

Be it known that I, THOMAS BARNETT, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Dredgers, of which the following is a specification.

My invention relates to digging and dredging apparatus.

It consists in a combination of parts, and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the device. Fig. 2 is a sectional detail of the turnable tower. Fig. 3 is a diagrammatic view of the device in use.

It is the object of my invention to provide an apparatus which is capable of excavating material either located beneath the surface of water, or where little or no water is present, such apparatus being so flexibly mounted that it is capable of excavating material at any desired point, and transferring and discharging it to a very considerable distance from the point of excavation.

I have shown my apparatus as mounted upon a boat or float A for use as a dredger, but it will be manifest that the carriage or support for the apparatus may be capable of progression over the land when such use is desirable. The boat or float A may be made rectangular and preferably made square, and the apparatus is centrally mounted with relation to the boat so that it may be turned to any desired point with relation thereto. The float may be anchored and kept stationary by means of piles or spuds 2 which will be driven into the mud at the point selected for operation.

The boat may be designed to receive the dredgings if desired, or boats or transfer barges may be brought up alongside of the dredge boat and discharge made into such barges. If it be desired to deposit the dredgings to form a filling or levee, the apparatus, after being loaded, may be turned to the desired point of discharge.

The dredging apparatus is mounted upon a sufficiently strong platform or tower. In the present case I have shown a platform 3 having a stout central post or mast 4 projecting upwardly and forming the center about which the supporting and turnable tower 5 is movable. This tower may be made in any suitable manner. As here

shown it comprises stout posts supported upon a circular platform 6 which is turnable about the central post, and rests upon bearing rollers 7 which are journaled and carried upon a base, and turnable upon radially disposed shafts or axes.

The circular platform may be turned by the application of power from an engine, or other suitable motor. I have here illustrated the turning mechanism as consisting of a gear 9 fixed to the central post 4, and a pinion 10 meshing with the gear, and through which the power may be applied. It will be understood however that any suitable, desired, or mechanical device may be employed for this purpose.

The dredging apparatus consists of a frame-work comprising parallel bars 11 which are hinged to the tower or support 5, and turn about a horizontal journal-shaft so that this frame-work may be tilted up and down about said shaft or support.

12 is a rectangular frame-work which may be made of angle, channel, or other form of steel bars strongly braced and united, as by cross bars 13, or equivalent connections. This frame-work is slidable within the frame-work 11 so that it may be extended or drawn up at pleasure. The frame-work 11 is provided with horizontally journaled rollers 14 between which the frame-work 12 is slidable, and exterior rollers 15 against which the outer sides of the frame-work 12 contact so that in moving the frame-work 12 within the supporting frame 11, the least possible friction will take place.

16 is the dredge bucket which I have here shown eccentrically pivoted between the lower ends of the frame bars 12. This bucket is made of a D shape, and it has a lower cutting edge 17 which may be made either plain or serrated, depending upon the character of the material to be operated upon. To the upper lip of the bucket is connected a rod 18 and this connects with one arm of the lever 19 fulcrumed upon the sliding frame 12. This lever has the other arm projecting so as to be engaged by a stop upon the main frame 11 to dump the load of the bucket as will be hereafter described.

In order to operate the device, it will be understood that the guide frame 11 must be set at such an angle as to allow the bucket to reach the bottom or surface to be operated upon, when the frame-work 12



is allowed to slide downwardly and outwardly between its guiding rollers. In order to control this apparatus I have shown segmental racks 20 connected with the upper end of the main frame 11, and having suitable pawl engagements upon the tower or support 5. Power may be applied to tilt the frame 11 in any suitable manner not specifically here shown, and when this frame is at the desired angle the bucket-carrying frame 12 is allowed to slide downwardly until the bucket strikes the surface to be excavated.

The shape of the bucket and its pivoting are such that as soon as the bottom or outer surface of the bucket strikes the bottom, it will be immediately tilted about its pivots so as to bring the cutting edge 17 in position to excavate the material and fill the bucket. The link, 18, is connected to the outer lip of the bucket and prevents the bucket from dropping any lower on account of the engagement of the lever, 19, with its pivot strap, as shown in Fig. 1. This takes place as soon as the carrying-frame or ladder 12 begins to be retracted. The retraction of this bucket-carrying ladder will immediately fill the bucket, and as it is drawn upward along the guiding frame, the bucket will resume its normal upright position, and retain this position until it is desired to discharge. The discharge takes place by the contact of the long arm of the lever 19 with a lug or stop 21 which is adjustably fixed upon the main guide frame 11. Thus if it is desired to discharge the load into the dredge boat itself, the stop 21 is moved upwardly to a point where the lever will not contact the stop until the dredge bucket has arrived at a point vertically above the interior of the boat. If it be desired to discharge it upon a lighter, or barge, or at some other point where the deposit is desired, and exterior to the dredge boat, the stop is moved downwardly so that the lever will contact with it before the bucket has reached the line of the boat.

In order to move the bucket-carrying ladder I have shown a windlass 22 which may represent any suitable winding apparatus to which power may be applied from a suitable motor not shown. Around this windlass or drum passes a heavy wire cable or chain 23, thence over guide pulleys 24, and down to a point of attachment upon the movable ladder or frame 12. It will thus be seen that by winding or unwinding the cable upon its windlass or drum, the ladder may be drawn up or extended at will. Any suitable pawl and ratchet or locking mechanism, as illustrated at 25, may be employed to retain the ladder and bucket at any desired point of elevation so that after having been loaded and drawn up to the desired elevation, the apparatus may be still fur-

ther tilted to raise the bucket clear of possible obstructions by means of the mechanism previously described for vertical tilting of the frame 11. Then by means of the turning mechanism illustrated at 9 and 10, the whole apparatus may be turned about the tower or support and the bucket projected to any desired point of discharge. It will thus be seen that a very flexible apparatus is produced. The main supporting tower being turnable around a full 360° of the circle about its vertical journal-post, the frame-work in which the bucket-carrying ladder is slidable may also be tilted from approximately a horizontal position to any desired angle of declination whereby the ladder may be extended, and the bucket carried to any point from which the material is to be taken. The bucket itself, by reason of its buoyancy when empty, produces a cushioning effect so that the ladder may be allowed to slide out very rapidly, and the bucket striking the water will arrest and check the movement, allowing the remainder of the movement after the bucket is submerged, to continue somewhat more slowly, until it reaches the point where the work is to be done. If the ground is stiff or hard clay, or friable rock, the bucket may be armed with projecting spikes or teeth on the lower or bottom sides or edges, so that by allowing the ladder to slide outwardly at a considerable speed, the weight of the ladder and the bucket will cause the spikes to enter and loosen the material, breaking it up so that the bucket will afterward be able to load itself when the apparatus is drawn upward as previously described.

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

1. The combination in a dredging and digging apparatus, of a support and inclined frame-work carried thereon, a slidable frame or ladder movable in line with the first named frame-work, a bucket horizontally and eccentrically journaled at the lower end of the ladder so that a rearward movement of the ladder automatically turns and loads the bucket, and means for raising the ladder, and discharging the bucket.

2. The combination in a dredging and digging apparatus, of a main support, a tower turnable about a vertical axis, a guiding frame hinged to said tower, means by which the frame may be tilted in a vertical plane, a ladder guided and slidable within said frame, a bucket horizontally and eccentrically journaled at the lower end of the ladder so that a rearward movement of the ladder automatically turns and loads the bucket, mechanism by which the ladder is retracted and the bucket loaded, a lever carried upon the ladder and means connecting the lever with the bucket, and an ad-



justable stop on the guiding frame with which the lever contacts when the ladder is drawn upward, and the bucket is tilted and discharged.

5 3. The combination in a dredging and digging apparatus, of a dredge boat, and means for fixing said boat in position, a tower or support mounted upon the boat and turnable about a vertical axis, a guide  
10 frame, a horizontal hinged shaft upon the tower about which the frame is tiltable, means to lock it at any desired angle, a ladder guided and slidable within the tiltable frame, a D-shaped bucket eccentrically  
15 pivoted to the lower end of the ladder, so that a rearward movement of the ladder automatically turns and loads the bucket, said bucket having a cutting or excavating edge, mechanism by which the ladder is  
20 lowered in the angular direction of its support to cause the bucket to contact with the surface to be excavated, means by which the ladder is retracted to fill the bucket and afterward raise it above the surface, mechanism by which the tower or support may  
25 be turned about the vertical axis to direct the ladder and bucket to any desired point of discharge.

4. The combination in a dredge and digger, of a boat, a support and a tower located upon said boat, a turntable movable upon rollers, and mechanism whereby the tower may be revolved about its vertical axis, a guide frame hinged to the tower to raise  
30 and lower in a vertical plane, said frame having rollers, a ladder guided and slidable between said rollers, a D-shaped bucket eccentrically hinged to the lower end of the ladder having a cutting edge whereby it is  
35 capable of being drawn along the bottom and filled, mechanism by which the ladder is allowed to extend by gravitation, mechanism by which the guide frame of the ladder may be tilted about its axis of support to  
40 raise or lower the bucket, locking mechanism

to retain the parts at any point of adjustment, and mechanism consisting of a fulcrumed lever connected to and movable with the bucket and ladder, and a fixed stop whereby the bucket may be automatically  
50 tilted.

5. The combination in a dredging and digging apparatus, of a guided slidable ladder, means to change its angle of sliding movement, a horizontally journaled bucket  
55 carried at the lower end of the ladder, the journal of the bucket being eccentrically placed whereby a rearward movement of the ladder automatically turns and loads said bucket, and means by which said bucket  
60 is reversed and emptied.

6. The combination in a dredging and digging apparatus, of a guided slidable ladder, a D-shaped bucket horizontally and eccentrically journaled at the lower end of  
65 the ladder, so that a rearward movement of the ladder automatically turns and loads the bucket, and mechanism actuated by the upward movement of the ladder whereby the bucket is automatically turned and discharged.  
70

7. The combination with a dredging and digging apparatus, of a segmental or D-shaped bucket, a ladder or frame, eccentrically located pivots about which the  
75 bucket is horizontally turnable in the frame, said pivoting means acting to turn the bucket and present its mouth to be loaded when the bucket contacts with the surface, and returning the bucket to an upright position when it is raised from the surface, and means for limiting the lowering movement of the bucket about its pivots.  
80

In testimony whereof I have hereunto set my hand in the presence of two subscribing  
85 witnesses.

THOMAS BARNETT.

Witnesses:

GEO. H. STRONG,

CHARLES A. PENFIELD.