

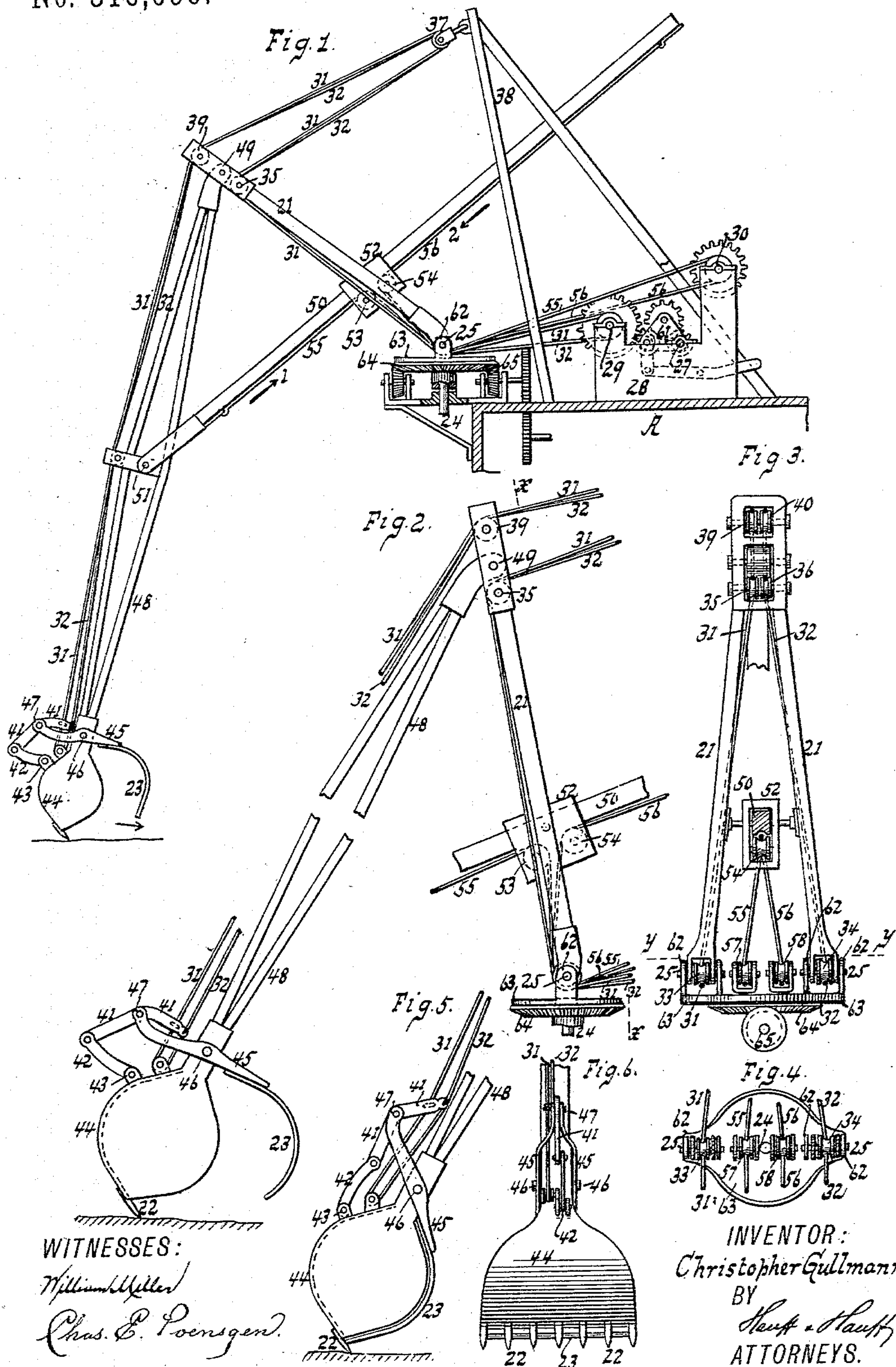
(No Model.)

2 Sheets—Sheet 1.

C. GULLMANN.
DREDGING APPARATUS.

No. 516,090.

Patented Mar. 6, 1894.



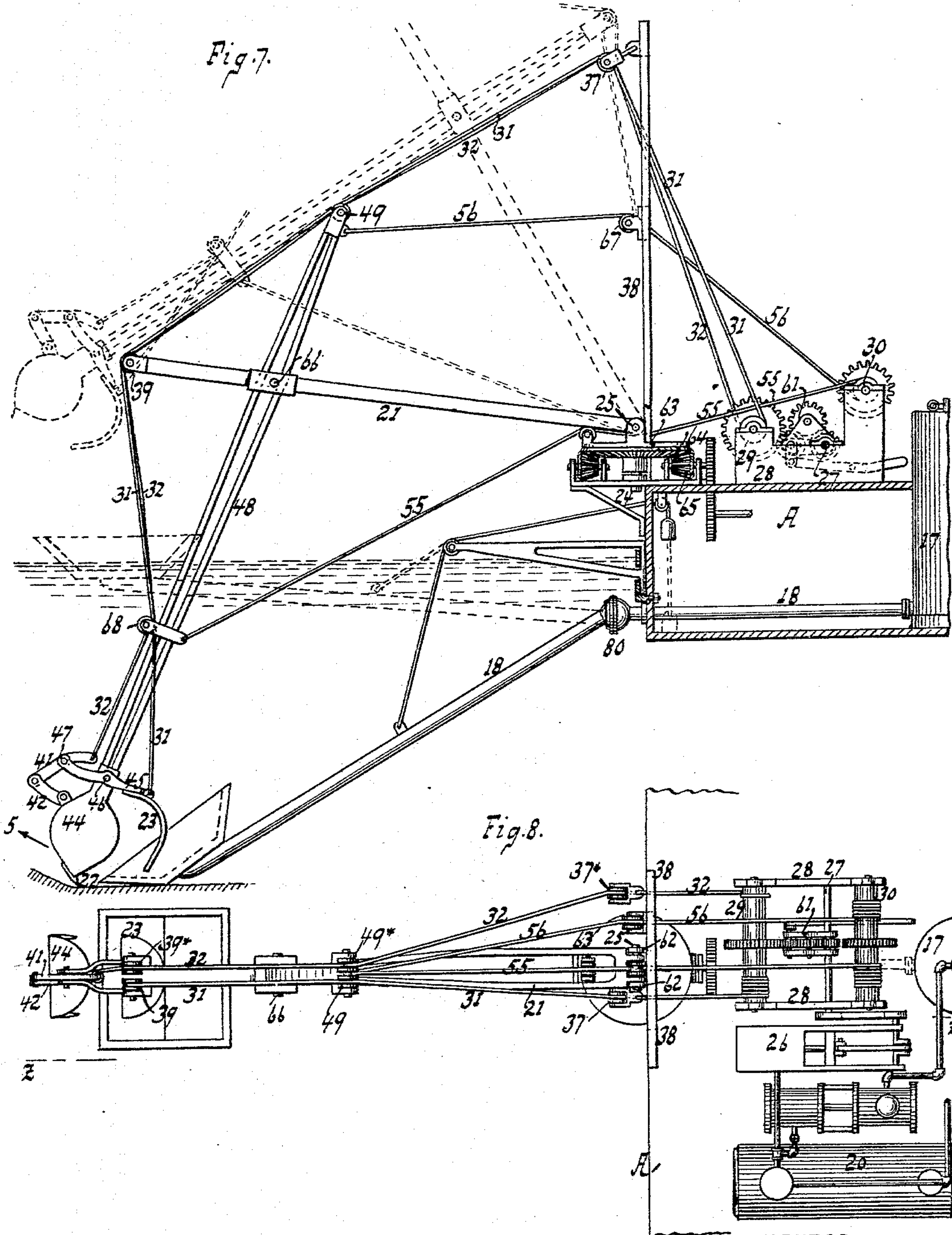
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WITNESSES:

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UNITED STATES PATENT OFFICE.

CHRISTOPHER GULLMANN, OF NEW YORK, N. Y.

DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 516,090, dated March 6, 1894.

Application filed June 15, 1893. Serial No. 477,698. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER GULLMANN, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Dredging Apparatus, of which the following is a specification.

This invention relates to certain improvements in dredging apparatus as pointed out in the following specification and claims and illustrated in the accompanying drawings in which—

Figure 1 is a partial side elevation of my scraper and grapple and the mechanism for operating the same. Fig. 2 is a side elevation of a portion of the mechanism shown in Fig. 3 on a larger scale than the previous figure; the grapple being open. Fig. 3 is a vertical section in the plane $x x$ Fig. 2. Fig. 4 is a horizontal section in the plane $y y$ Fig. 3. Fig. 5 is a side elevation of the scraper and grapple when the grapple is closed. Fig. 6 is a face view of the same. Fig. 7 is a sectional side elevation showing a modification of the means used for actuating the scraper and the grapple. Fig. 8 is a plan or top view of the same.

The object of my invention is to provide an apparatus by means of which the material which is to be removed, can either be taken up bodily and dumped on the desired spot, or said material can be moved up to the mouth of a suction pipe which forms part of a suction and discharge apparatus, by means of which the material is finally dumped on the desired spot.

In the drawings the letter A designates the scow or dredge boat which contains a suction and discharge apparatus 17 (Figs. 7 and 8) by means of which a portion of the material to be removed is drawn in through a suction pipe 18 and then forced out upon the dumping ground through a discharge pipe (not shown). Any suitable suction and discharge apparatus may be used, but in the example illustrated in the drawings I have shown a drum which is charged with steam from a boiler 20 (one or more) and then the steam is condensed so as to create a partial vacuum in the drum and to produce the required suction, by which the material is drawn into the drum and then live steam is admitted to the drum, by the pressure of which the refuse is forced out to the dumping ground. On the

deck of the scow is mounted a crane 21 which carries a scraper 22 and a grapple 23, said crane being so constructed that it can be swiveled around on a stud 24 to which it is connected by pivots 25 so that it can be brought to an inclined or vertical position, thereby lowering or raising the scraper and grapple as may be required. For the purpose of actuating the crane, the scraper and the grapple I employ a steam engine 26 (Fig. 8) from which motion is imparted to a shaft 27 mounted in a frame 28 in which are also mounted two drums 29 and 30. In the example shown in Figs. 1 to 6 ropes 31, 32 extend from the drum 29 under pulleys 33, 34 (Figs. 3 and 4) which are mounted on the pins 25 and from these pulleys said ropes extend over pulleys 35, 36 to sheaves 37 attached to a standard 38 which is firmly secured to the deck of the scow A (Fig. 1.) From the sheaves 37 the ropes 31, 32 extend over pulleys 39, 40 mounted in the crane 21 (Figs. 1 and 3) thence down to the grapple 23 and their ends are fastened together and secured to the end of a lever 41. This lever is pivoted to a link 42, which swings on a pivot 43 secured in a bracket connected to the head 44 of the scraper 22 (see Figs. 1, 2 and 5.) The grapple 23 is secured to a lever 45 which swings on a pivot 46 secured in the shank 48 of the head 44 and the tail end of which is attached by a pivot 47 to the lever 41. The ropes 31 and 32 are wound in opposite directions upon the drum 29 and if this drum is turned so as to take up the rope 32 and let off the rope 31, the grapple 23 is moved from its open position (Fig. 2) to its closed position (Fig. 5) and if the drum 29 is turned in the opposite direction, the grapple is opened.

In the example shown in Figs. 1 and 2 the shank 48 of the head 44 is connected at its end to the crane 21 by a pivot 49 and to said shank is secured a slide 50 by means of a pivot 51 and this slide extends through a guide 52 which is pivotally secured to the crane 21 (Fig. 3.) In the guide 52 are mounted two pulleys 53, 54 and on the slide are secured two ropes 55, 56. The rope 55 extends over the pulleys 53 and under a pulley 57 to the drum 30 which is mounted in the frame 28 (Fig. 8) and the rope 56 extends over the pulley 54 and under a pulley 58 to the drum 30 (see also Figs. 3 and 4). The ropes 55, 56 are wound in opposite directions upon

the drum 30 and if this drum is turned so as to wind up the rope 55 and unwind the rope 56, the slide 50 is moved inward in the direction of arrow 1, (Fig. 1) but if the drum 30 is turned so as to wind up the rope 56, the slide 50 is moved outward in the direction of arrow 2. By these means an oscillating motion can be imparted to the scraper 22 and the head 44 can be moved down upon the ground or moved up away from the ground.

The motion of the drums 29 and 30 can be controlled by a suitable reversing gear 61 as shown in Fig. 1.

The pivots 25 which support the feet of the crane 21 are mounted in lugs 62 which rise from a plate 63 (Figs. 2, 3 and 4) secured to a bevel-wheel 64 which is mounted upon the stud 24 and engages a bevel-wheel 65 which is geared with the driving-shaft 27 so that a rotary motion can be imparted to it in either direction. In the example shown in Figs. 7 and 8 the shank 48 of the head 44 is connected to the crane 21 by a pivot 66 and from a point above this pivot extends the rope 56 over a pulley 67 which is secured to the standard 38 and from a point below the pivot 66 extends a rope 55 over a pulley mounted on the plate 63. The ropes 55, 56 are wound upon the drum 30 in opposite direction and if this drum is turned so as to take up the rope 56 and let out the rope 55, the head 44 of the scraper is moved in the direction of arrow 5 (Fig. 7) and if the drum 30 is turned in the opposite direction, the head 44 moves in the direction opposite to arrow 5. By these means an oscillating motion can be imparted to the scraper. The rope 31 extends from the drum 29 (Fig. 8) over a pulley 37 which is attached to the standard 38, thence over pulleys 49, 39 to a pulley 68 secured to the shank 48 of the scraper, thence to lever 45 to which it is fastened. (See Figs. 7 and 8). The rope 32 extends from the drum 29 over a pulley 37* secured to the standard 38, thence over pulleys 49* 39* to a pulley mounted on the side of pulley 68 (Fig. 7) thence to lever 41 to which it is fastened. When the rope 31 is wound up on drum 29, the grapple is opened and when the rope 32 is wound up, the grapple is closed. At the same time when the operation of winding up the rope 31 is continued after the grapple has been opened, the grapple and the crane are carried up to the position shown in dotted lines in Fig. 7 and if it is desired to carry up the grapple in a closed position, the operation of winding up the rope 32 must be continued after the grapple has closed. Furthermore if the grapple is raised in a closed position it can be opened by reversing the motion of the drum 29 so as to wind up the rope 31 while the rope 32 is unwound to such an extent that the lever 41 can move from the position shown in Fig. 5 to that shown in Fig. 2. If the scraper while bearing upon the ground, is moved in the direction of the arrow shown near it in Fig. 1, the

grapple is charged with sand or other matter and the contents of the grapple can be moved up to the mouth of the suction pipe 18, and I prefer to make the mouth of this pipe bell-shaped so that when the contents of the grapple are dumped into this mouth, they are in the proper position to follow the suction. The suction pipe 18 is provided with a ball and socket joint 80 and suitable mechanism is provided to raise said suction pipe from the ground as shown in dotted lines in Fig. 7 and by raising the grapple the contents of the same can be dumped into the bell-shaped mouth of the suction pipe.

It must be remarked that the drums 29 and 30 may each be made in two sections, each of which is driven independent of the other in the manner commonly used in hoisting machines and described in patent to John Knowlson, Jr., No. 150,765, dated May 12, 1874, and many others.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the suction-pipe 18, of an oscillating scraper for moving the material to the entrance of the suction-pipe, and mechanism for oscillating the scraper to and from the suction-pipe, substantially as described.

2. The combination with the suction pipe 18 of a scraper and a grapple and mechanism for imparting to the scraper and grapple a reciprocating and a rising and falling motion substantially as described.

3. In a dredging apparatus, the combination with a suction pipe, of a pivoted swinging crane, mechanism for swinging the crane vertically, a shank pivotally connected with the crane, carrying a scraper and a grapple and movable to and from the suction pipe for causing the scraper to move the material to the entrance of the suction pipe, and means for moving the shank and operating the grapple, substantially as described.

4. In a dredging apparatus, the combination of a pivoted swinging crane, mechanism for swinging the crane vertically and also laterally, a shank pivoted to the crane and carrying at its lower end a scraper and a grapple, a slide pivoted to the shank and having a sliding engagement with the crane, and means for operating the grapple, substantially as described.

5. The combination with a suction-pipe 18, of a pivoted swinging crane, a shank connected with the crane and provided at its lower end with a scraper 22 for moving the material to the entrance of the suction-pipe, and means for swinging the crane and oscillating the shank, substantially as described.

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

CHRISTOPHER GULLMANN.

Witnesses:

WM. C. HAUFF,
E. F. KASTENHUBER.