(No Model.) 2 Sheets—Sheet 1.

Z. WILLIAMS.

DREDGING MACHINE.

No. 253,145. Patented Jan. 31, 1882.

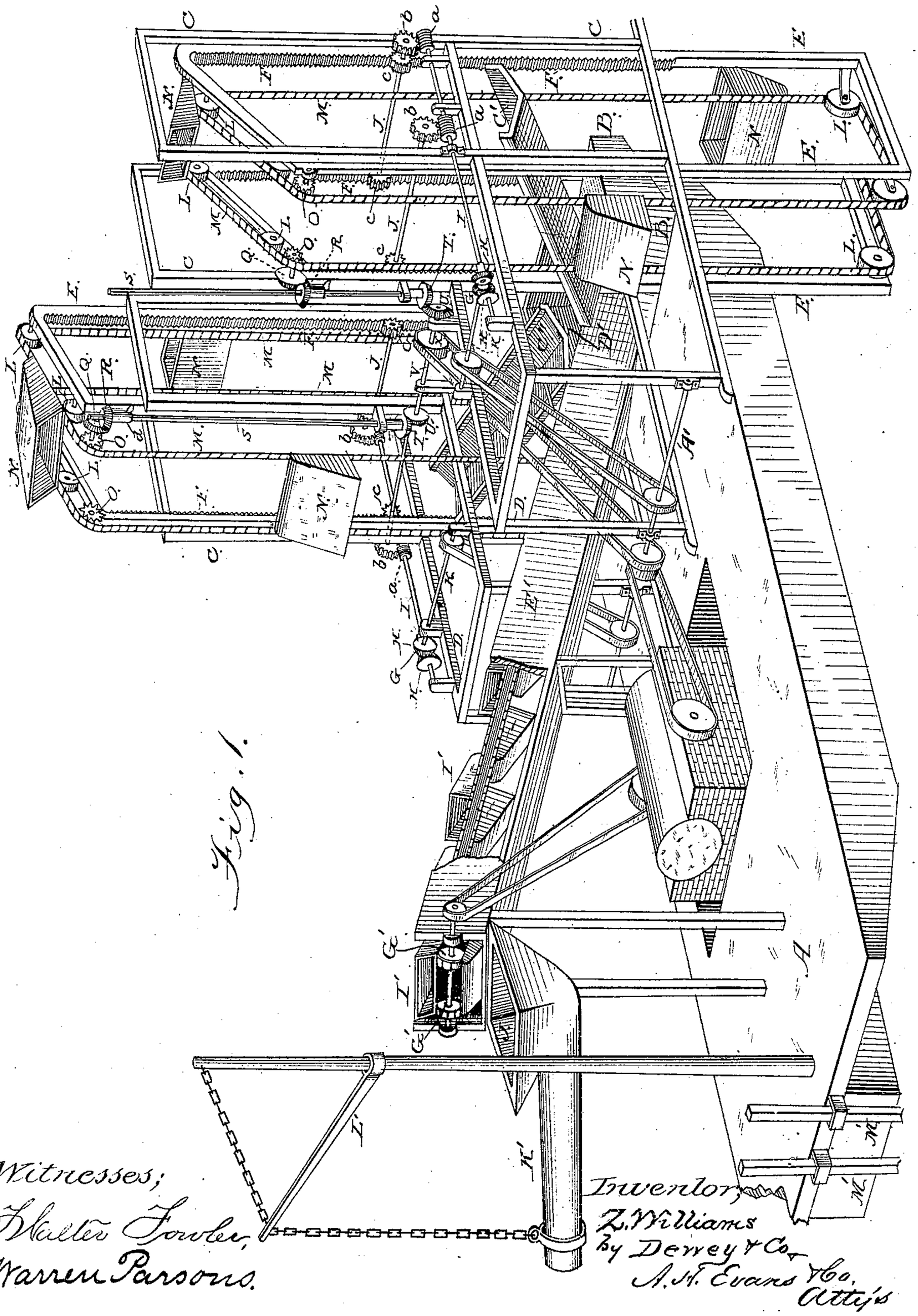


Fig. 1.

Witnesses;
Walter Fowler,
Warren Parsons.

Inventor;
Z. Williams
by Dewey & Co.
A. N. Evans & Co.
Atty's

(No Model.)

2 Sheets—Sheet 2.

Z. WILLIAMS.

DREDGING MACHINE.

No. 253,145. Patented Jan. 31, 1882.

Fig. 2

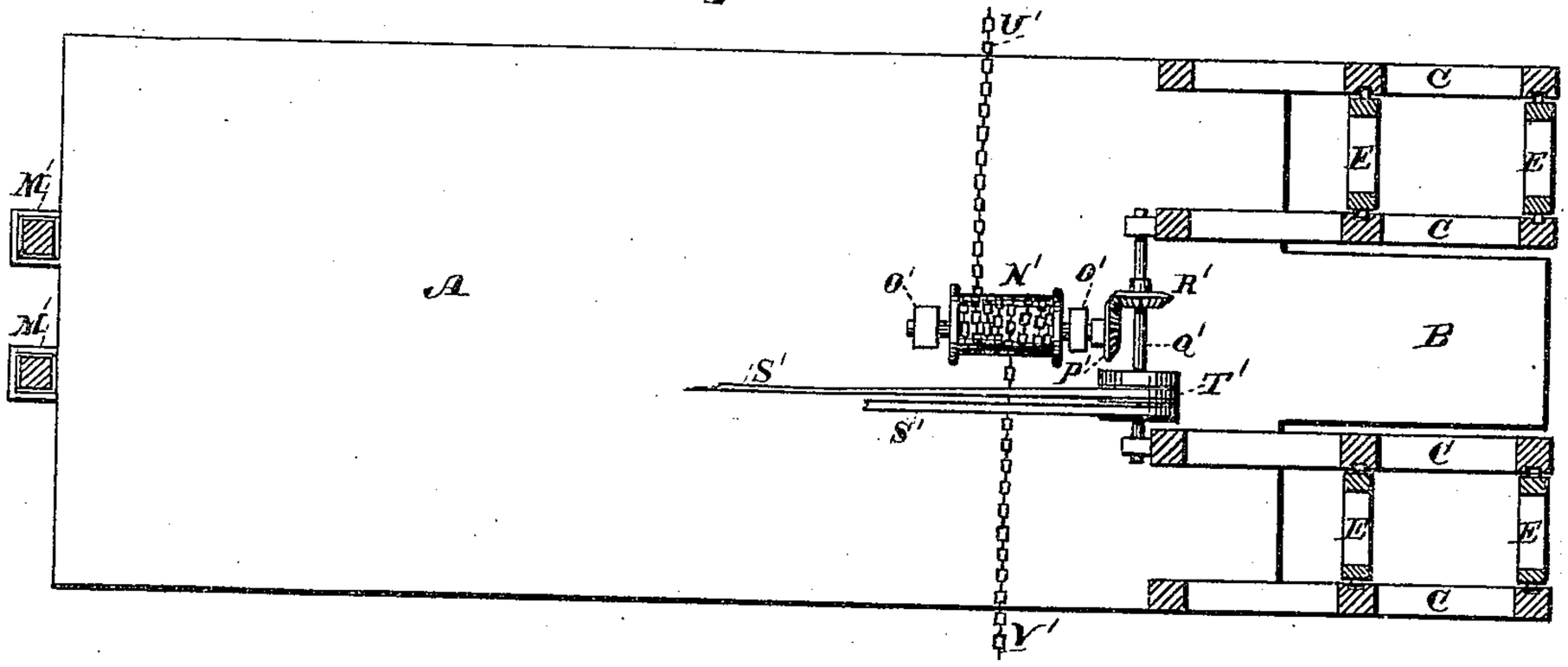


Fig. 3.

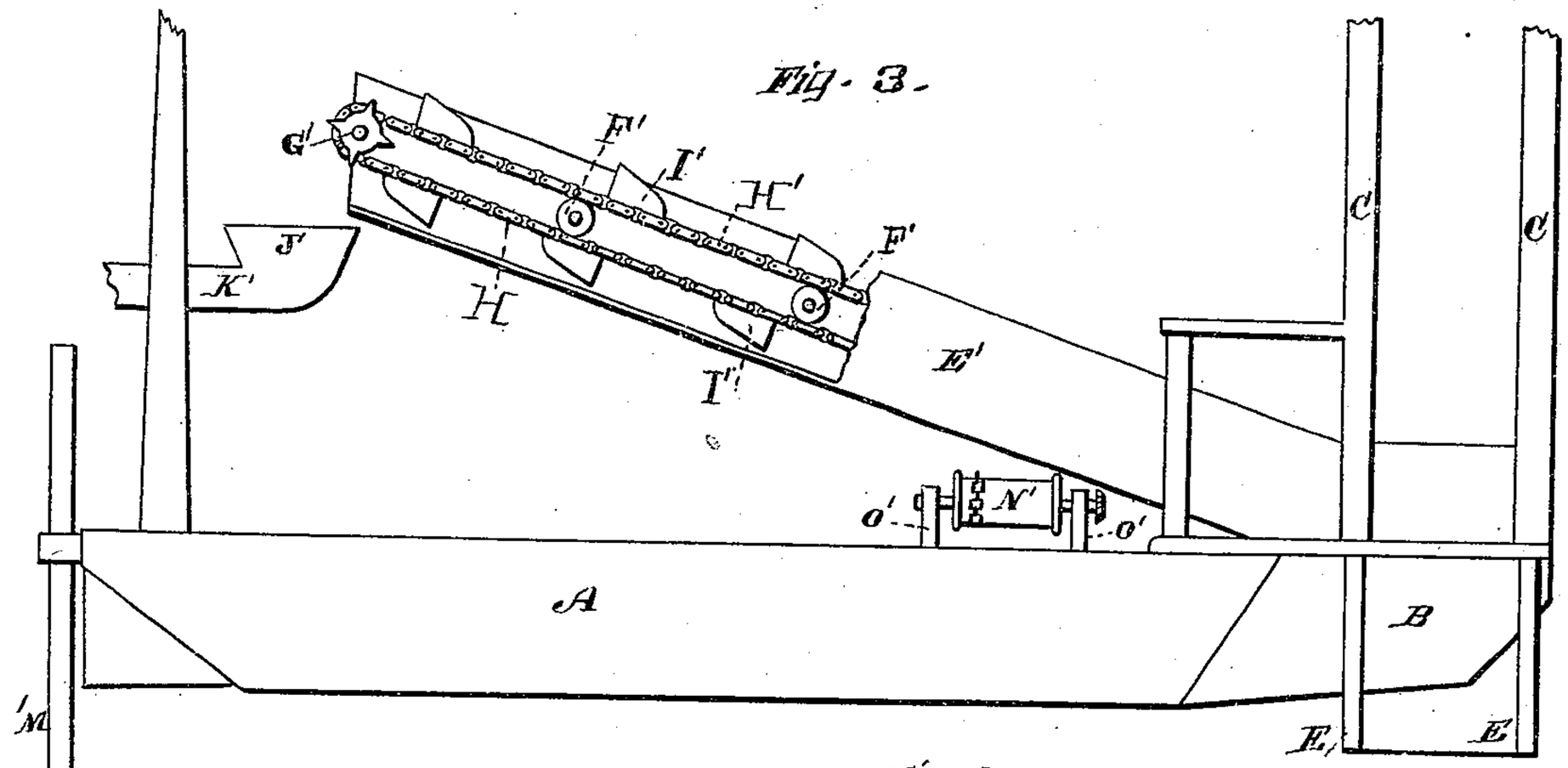
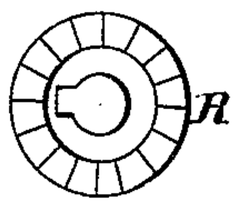


Fig. 5

Fig. 4



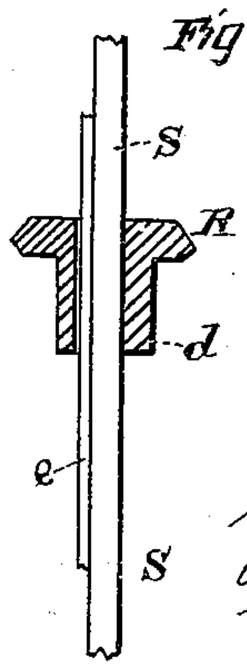


Fig. 6

Witnesses
Frank A. Brooks
S. A. Sourse

Inventor
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By Dewey & Co
Attys.

UNITED STATES PATENT OFFICE.

ZEPHANIAH WILLIAMS, OF OAKLAND, CALIFORNIA.

DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 253,145, dated January 31, 1882.

Application filed August 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, ZEPHANIAH WILLIAMS, of Oakland, county of Alameda, State of California, have invented an Improved Dredging-Machine; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the class of dredging-machines and consists of certain improvements upon my invention secured to me by Letters Patent No. 225,194, dated March 2, 1880.

The nature and object of my invention will be seen in the following specification and accompanying drawings, reference to which is hereby made, and in which—

Figure 1 is a perspective view of my dredger. Fig. 2 is a view showing means of advancing the dredger. Fig. 3 is a view of the inclined way. Figs. 4, 5, and 6 are detailed views.

Let A represent the dredge-scow having an extended front, B, narrow, as shown, whereby shoulders or offsets are made on each side of the front, in which the towers C C are built. These towers are constructed of frame-work and are supported from the scow by means of a frame-work of timbers, (here marked D,) and which form a support for the various operating mechanisms hereinafter explained. There are two towers—one on each side—and they are not built as high as the tower shown in my previous invention, one of the objects of the present invention being to discharge the mud at a low point, whereby the towers may be made low, and thus avoid any top-heaviness which would result from having a high tower. Within the towers C C are the ladders E E, adapted to have a vertical play therein, sliding upon appropriate guides or ways. The forward top sides of these ladders are made higher than the rear top sides, as shown, so that the buckets which pass from the forward top side to the rear top side will have a downward incline and will discharge their contents. These ladders are the frames upon which the chains with their buckets are hung and over which they travel, so that it is necessary that they be adapted to slide up and down in order to depress the bucket to the mud-bank below. The mechanism which accomplishes this result is as follows: The inner sides of the ladders are formed into vertical racks or provided with gears, as shown by F. Supported outside the towers are the short shafts K, carrying the bevel-gears G, which mesh with bevel-gears H H upon shafts I, which extend outside the towers, and are provided with worm-gears *a*, which mesh with worm-wheels *b* upon shafts J. Said shafts carry pinions *c*, which mesh with the racks F upon the ladders. The bevel-gears H H are upon each side of the gears G, and have clutch mechanism operated by any appropriate device, whereby one or the other may be thrown in or out of gear in order to raise or lower the ladders. The shafts K receive their motion through belts driven from the first counter, as shown.

L L represent various pulleys upon the ladders E E in convenient positions for the chains M with their buckets N to pass over.

O O represent sprocket-wheels journaled in brackets attached to the ladders. The shafts which carry the sprocket-wheels carry bevel-gears Q, with which mesh pinions R upon the vertical shafts S. The pinions R are upon boxes *d d*, and have a groove within, into which a feather, *e*, upon the vertical shafts S, fits, so that the device—that is, the pinions R and their boxes *d*—may move up and down upon the vertical shafts with the ladders, and yet continue to operate the chains. The lower ends of the vertical shafts S are provided with bevel-gears T, which mesh with others, U, upon the ends of the shaft V, supported upon the second counter of the frame-work. The shaft V carries a pulley, X. A belt transmits power to the shaft V from the first counter, A′, which communicates by belt with driving-power on the scow.

The operation thus far will be as follows: Motion is transmitted from the engine to the first counter, thence to the second counter, and to the shaft V. This operates the vertical shafts S S, which operate the sprocket-wheels O O, and thus revolve the chains with their buckets. Power is transmitted from the first counter to the shafts K, which operate either one of the gears H H, according to whether it is desired to raise or lower the ladder, the gear G being thrown into engagement with one or the other by any well-known shifting apparatus. I raise and lower the ladders, the feathered shafts S S allowing the driving mechanism to move with the ladders.

Within the towers, just below the second counter, are the spouts C′ C′, inclined downwardly and opening into the tank D′, which is supported between the towers, as shown. Opening from this tank D′ is an extended way, E′, upon which are pulleys, F′, and sprocket-wheels G′, upon its upper end, over which pass the chains H′, carrying buckets I′. The sprocket-wheel G′ receives motion from the driving-power directly, by means of a bolt, as shown. The spout or way E′ is inclined upwardly and rearwardly, being supported from the scow appropriately. Immediately under the rear end of the inclined way E′ is the hopper J′, having an extended spout K′, supported by and under the boom L′. When the buckets upon the ladders in front descend and take up mud they carry it up to the top of the towers, and in passing over the higher forward side to the lower rear side are inclined sufficiently to discharge their contents through the top of the towers into the inclined spouts C′ C′, from which the mud runs into the tank D′. The buckets I′ then pick it up and carry it up to the end of the extended way E′, and there discharge it into the hopper J′, from which it passes through the spout K′, and is finally discharged. By this construction I obtain a sufficient altitude from which to discharge the mud, without having to build high towers and thus render the scow top-heavy.

At the rear of the scow are two spuds, M′ M′. In the forward part of the scow is a horizontal gipsy, N′, supported upon and journaled in standards O′, and carrying upon the end of its axis a bevel-gear, P′.

Q′ is a shaft, having on one end a bevel-gear, R′, meshing with the gear P′, and on its other a triple-faced pulley, T′, the middle face being loose upon the shaft. Belts S′ S′, from the driving-power, one being crossed to reverse the motion, operate the pulley T′. A chain, U′, is wound upon the gipsy and extends outwardly to one side to an anchor in the bed of the stream. Another chain, V′, is wound upon the gipsy in a reverse manner, and extends outwardly on the other side of the scow to another anchor.

The object of these devices is as follows: I place the scow in position and drop one of the spuds. I then place the proper belts S′ upon its stationary face of the pulley T′, and wind up one of the anchored chains as the dredger works its way, so that its front makes an arc in the face of the mud bank as the dredger moves on its spud. When the extent is reached as previously marked out by stakes, the other spud, which, by the changed position of the scow, has advanced, is driven down, and the one which was down is raised, and the opposite chain wound up on the windlass or gipsy by using the other belt S′ and placing the first belt upon the loose face of the pulley T′. The scow is thus returned over a new and advanced arc, as defined by its new spud or pivot-point, and thus it is made to advance by its own oscillation.

The advantage of having two vertical towers and ladders is that I can run a double set of buckets, either from or to the scow, in the same direction, and thus one set can carry its work up to where the other began, and on the return-swing the other can work up to the first. Thus the scow is not required to swing as far as if there were only one tower in the middle of the front of the scow, instead of on the corners. It enables me to do a greater amount of work.

I am aware that broadly a spout similar to the spouts C C′, and also a receiving-tank similar to the central receiving-tank, D′, are not new, and such, therefore, I only make claim to in combination with my peculiar mechanism.

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

1. In a dredger, the vertical corner towers, C C, the ladders E E, with their racks F, said ladders being rendered adjustable within the towers by means of the gears G G, double gearing H H, shafts K and I, worm-screws *a*, worm-wheels *b*, and pinions *c*, substantially as herein described.

2. In a dredger, the vertical corner towers, C C, the adjustable ladders E E, having pulleys L L, boxes *d d*, and carrying-chains M, with buckets N, said chains being revolved by means of the sprocket-wheels O O, bevel-gears Q, T, and U, pinions R R, feathered shafts S S, and driving-shaft V, substantially as herein described.

3. In a dredger having vertical corner towers, C C, adjustable ladders E E, and carrying-buckets N, the inclined spouts C′ C′, with the central receiving-tank, D′, when arranged substantially as and for the purpose herein described.

4. In a dredger, the combination of vertical corner towers, C C, adjustable ladders E E, carrying-buckets N, the inclined spouts C′ C′, central receiving-tank, D′, and extended inclined way E′, substantially as and for the purpose herein described.

5. In a dredger, the combination of the vertical towers C C, the adjustable ladders E E, with their system of traveling buckets N, and the inclined way E′, with its system of buckets I′, substantially as and for the purpose herein described.

6. In a dredger, the rear spuds, M′ M′, in combination with the reversible gipsy N′ and anchored side chains, U′ and V′, substantially as and for the purpose herein described.

7. The method of advancing a dredger, consisting of securing it at its rear end alternately by means of spuds set on each side of the central line, and causing its front to swing to one side or the other over an arc, each spud acting alternately as a pivot-point, and being advanced at each swing of the scow, substantially as herein described.

8. The method of dredging by means of a dredger having towers and adjustable ladders

on its forward corners, said ladders carrying the traveling dredging-buckets, which consists in advancing said dredger by securing it at its rear end alternately by spuds set on each side of the central line, and causing its front to swing alternately to one side or the other over an arc, and causing one system of dredging-buckets to stop at a point on the arc where the other began, each spud acting alternately as a pivot-point, and advancing at each swing of the scow, substantially as herein described.

In witness whereof I have hereunto set my hand.

ZEPHANIAH WILLIAMS.

Witnesses:

WM. F. BOOTH,

J. H. BLOOD.