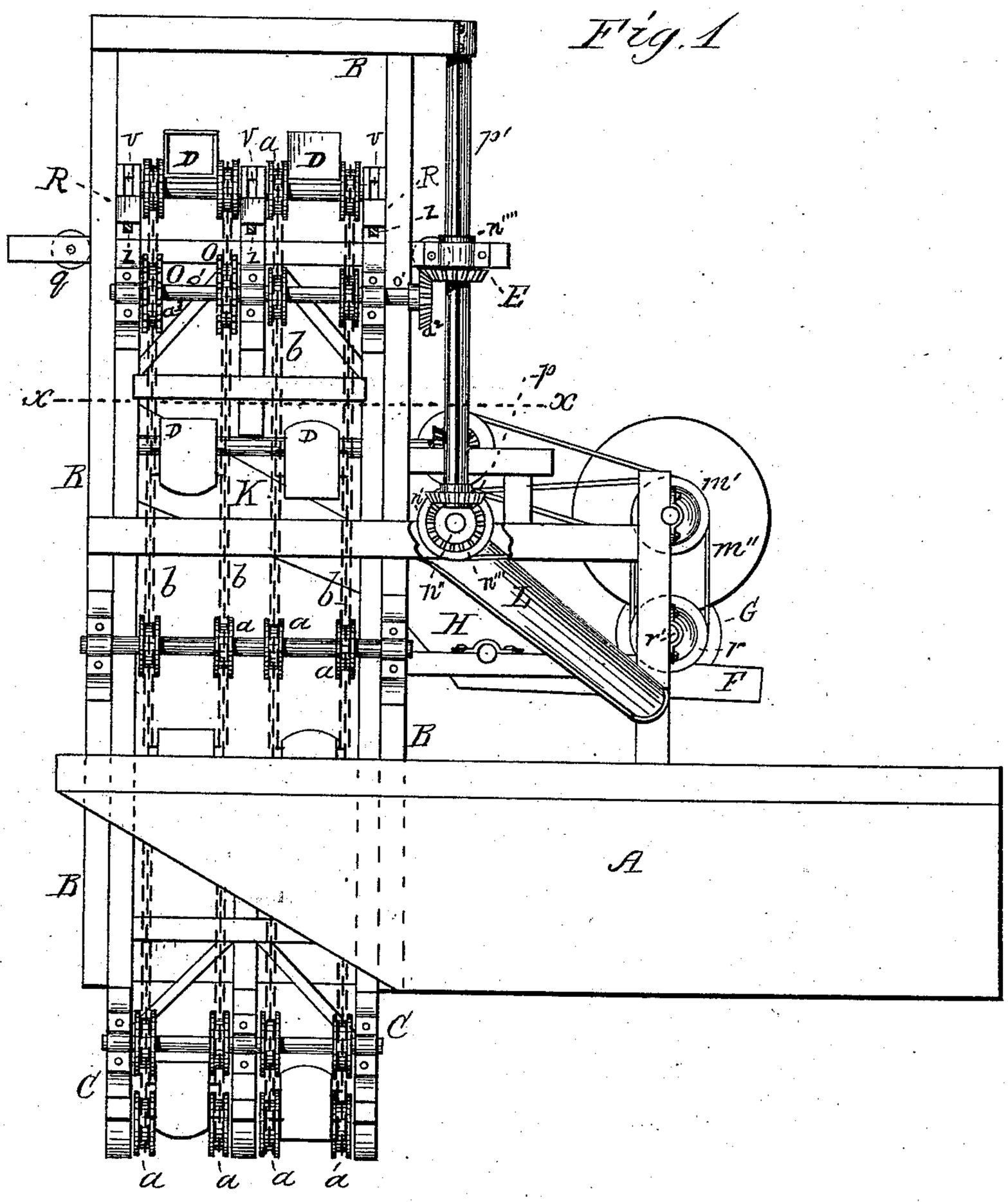
3 Sheets—Sheet 1.

Z. WILLIAMS.

Dredging-Machine.

No. 225,194. Patented Mar. 2, 1880.

Fig. 1



WITNESSES

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3 Sheets—Sheet 2.

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Dredging-Machine.

No. 225,194. Patented Mar. 2, 1880.

Fig. 2.

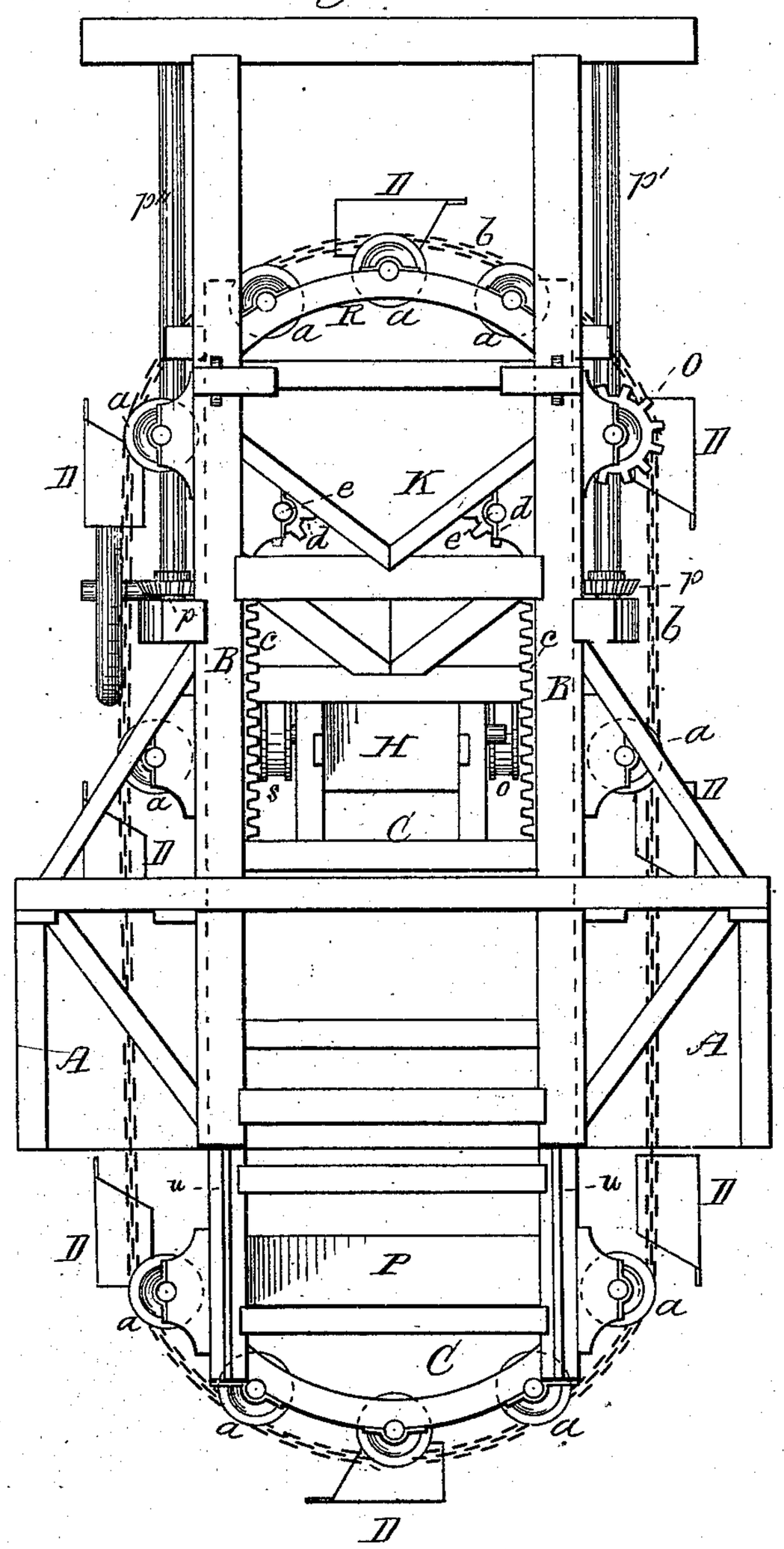

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Fig. 3.

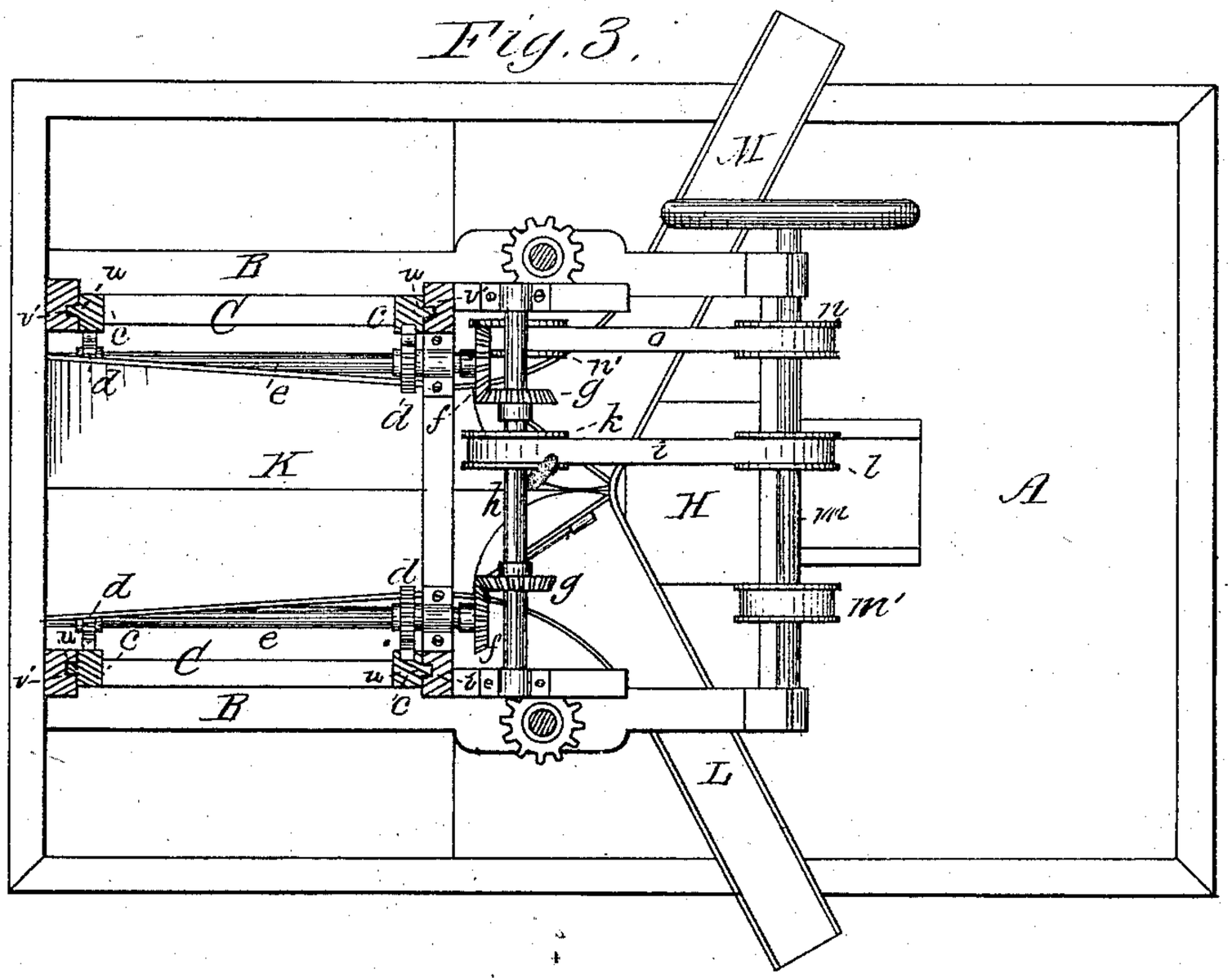


Fig. 4.

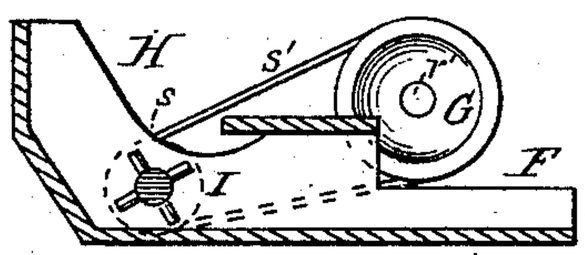
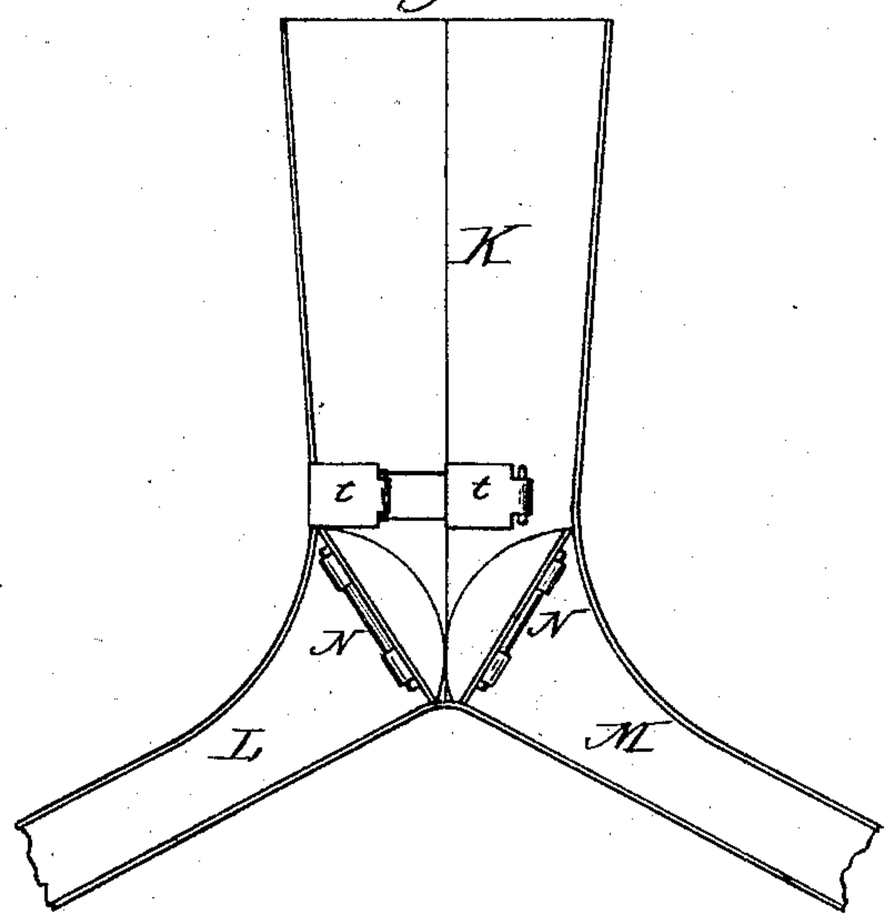


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

ZEPHANIAH WILLIAMS, OF OAKLAND, CALIFORNIA.

DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 225,194, dated March 2, 1880.

Application filed August 2, 1879.

To all whom it may concern:

Be it known that I, ZEPHANIAH WILLIAMS, of Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Dredges; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my invention; Fig. 2, a rear or back view of the same; Fig. 3, a top-plan view taken on line *x x* of Fig. 1; Fig. 4, a sectional detail view of the disintegrating-box; and Fig. 5, a detail plan view of the hopper and discharge-spouts.

This invention has relation to dredging-machines connected with a suitable scow or dredging-boat; and it has for its object to construct an adjustable ladder or frame, over which the bucket-chains are hung, and having the different sets of chains with their buckets work in opposite directions, to equalize the strain, and thus secure greater durability. It also has relation to the peculiar construction of the discharge-hopper and disintegrating-box, and the general details of construction, as will be hereinafter described, and subsequently pointed out in the claims.

In the accompanying drawings, A represents the float or dredge-scow, having rigidly connected thereto a skeleton-frame, B, provided with grooves *v'* in its inner faces, and arranged at right angles with the scow and at one end thereof. Within the frame B is arranged an elevator-frame, C, having splines *u* sliding in the grooves *v'* in the frame B, carrying upon its sides, top, and bottom grooved pulleys *a*, over which pass chains *b*, said chains having secured to them buckets D.

The elevator-frame C is provided with racks *c*, to engage with pinions *d* upon shafts *e*, said shafts also having bevel-gear wheels *f*, which engage with similar wheels *g*, keyed on a shaft, *h*. The shaft *h* is driven by a belt, *i*, passing over pulley *k* upon said shaft, and over pulley *l*, secured to a shaft, *m*, by which arrangement of gearing the elevator-frame C is elevated or lowered as required.

The shaft *m* has a pulley, *n*, over which passes a belt, *o*, to a pulley, *n'*, secured to a shaft, *n''*, arranged parallel with and below the shaft *h*. (See Fig. 1.) This shaft *n''* at its ends has bevel-gear wheels *n'''*, which engage with wheels *p*, secured to the lower ends of vertical shafts *p'*.

The sliding frame C, near its top, has friction-rollers *q*, which bear against the exterior of the stationary frame B. The frame C, near its top, has gear-wheels E, formed with sleeves *n''''*, (see Fig. 1,) through which pass the shafts *p'*. As the frame C is raised or lowered the wheels E slide upon the shafts *p'*; but when said shafts are rotated they carry with them the wheels E, which are feathered to grooves in the shafts.

The shaft *m* is provided with a third pulley, *m'*, over which passes a belt, *m''*, (see Fig. 1,) to a pulley, *r*, upon a shaft, *r'*, by which the shaft is driven. This shaft *r'* has bearings over a discharge-spout, F, (see Fig. 4,) and carries a pulley, G, somewhat larger in circumference than the pulley *r*, upon the opposite end of the shaft.

From the pulley G to a pulley, *s*, passes a belt, *s'*, for driving the shaft of the pulley *s*. That portion of the shaft of said pulley *s* located within the disintegrating-box H is provided with a disintegrating-wheel, I. From the front of the stationary frame B projects a hopper, K, inclined downward to a point over the disintegrating-box H, where it branches out into two discharge-spouts, L M. The spouts project out beyond the sides of the frame B. The lower end of the hopper K is provided with trap-doors *t*, (see Fig. 5,) closing openings through the hopper; and forward of the doors *t*, at a point where the spouts L M join the hopper, are gates N.

When the shaft *m* is rotated by suitable power the shaft *n''* is also rotated by means of the pulley *n'* on said shaft, connected with the pulley *n* by the belt *o*. The bevel-wheels *n'''* on the ends of the shaft *n''* in their rotation mesh with the bevel-gears *p* on the lower ends of the shafts *p'*, turning the latter in opposite directions. The bevel-gears E on the shafts *p'* also turn in opposite directions with said shafts, and engage with the bevel-gears a^2 (see Fig. 1) on the sprocket-wheel shafts *o'*, thus causing the sprocket-wheels O O (situated diagonally opposite each other on each side of the frame C) and the chains carrying the buck-

ets to revolve in opposite directions, so that the same amount of strain is caused by the buckets in either direction laterally, and thereby preventing all tendency to twist or turn the machine, as would otherwise be the case if but one set of buckets were used.

P is a hollow float, which is located at or near the lower end and in the elevator-frame C, and the latter may be adjusted vertically by filling the hollow float with water or pumping the same out, thereby raising or lowering the frame C.

By the employment of the hollow adjustable float P the frame C may be adjusted to the depth required for cutting, and in case of a hard bottom may be raised therefrom to prevent breakage of the buckets. As the buckets pass over the upper end of the frame C the back or door of the bucket is automatically tripped by any suitable tripping mechanism, and the contents discharged, the same dropping down into the hopper K, and as the gates N are open, the contents pass out through the spouts L M; or should but one mud-scow be loaded at a time one of the spouts only is used, the other being closed by its gate, which forms the wall of the spout. When the mud is designed to be conveyed to any distance from the scow the trap-doors *t* are opened, and the mud is dropped into the disintegrating-box H, where the disintegrating-wheel I grinds or mixes it with a suitable supply of water to allow it to flow freely through conductors to the required distance below the level of the discharge-spout F.

The bridge-trees R at the top and bottom of the frame C support the shafts of the chain-pulleys *a*. The ends of the bridge-trees are supported in elongated slots *b* (see Fig. 1) in the upper ends of the vertical beams of the frame C, so that the bridge-trees can be adjusted vertically by wedges *z* (see Fig. 1) inserted in the slots beneath the bridge-trees, or by other equivalent means.

I am aware that a dredging-machine provided with a hopper leading into spouts having gates has heretofore been employed, and I therefore lay no claim to such construction.

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

1. The stationary frame B, provided with the shafts *e*, carrying pinions *d* and bevel-gears *f*, shaft *h*, carrying pinions *g*, shaft *n''*, carrying bevel-gears *n'''*, and vertical grooved shafts *p'*, having bevel-gears *p*, in combination with the adjustable frame C, provided with racks *c*, sliding beveled feathered gears E, and shafts *o'*, carrying bevel-gears a^2, whereby the movable frame may be raised or lowered, substantially as described.

2. The stationary frame B, provided with the shafts *p'*, operated as described, in combination with the movable frame C, having shafts *o'*, sprocket-wheels O O, bevel-gears a^2 E, grooved pulleys *a*, chains *b*, and buckets D, whereby one set of buckets is revolved in an opposite direction from the motion of the other set, substantially as described.

3. The combination, with the scow A and stationary frame B, of the adjustable frame C and float P, substantially as and for the purpose specified.

4. The hopper K, provided with trap-doors *t*, and the spouts L M, having gates N, substantially as and for the purpose set forth.

5. The combination, with the hopper K, provided with trap-doors *t*, of the disintegrating-box H, arranged below said hopper and having the wheel I, operated by suitable belt and pulley, substantially as and for the purpose described.

6. The elevator-frame C, carrying buckets D, in combination with the disintegrating-box H and hopper K, provided with the trap-doors *t*, the spouts L M, and the gates N, substantially as and for the purpose described.

ZEPHANIAH WILLIAMS.

Witnesses:
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FRANK R. BRAUN.